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THE AGRICULTURAL ECONOMY OF COLOMBIA

By Kathryn H. Wylie*

Colombia is rich in mineral and forest resources, but the value of agricultural production far surpasses wealth from other sources. Wide temperature variations within the country enable Colombia to produce tropical, semitropical, and Temperate Zone crops. By far the most important of these is coffee, the major export. Perhaps more than any other Latin American country, Colombia promises to develop into a rich production plant to supply tropical products, especially for United States consumption, and, in turn, provide an expanding market for the products of the United States.

BACKGROUND OF THE ECONOMY

Location and Area

Colombia is in one of the most advantageous spots in the world for trade with the United States. It is in the extreme northwestern corner of the South American Continent, with coast lines on both the Pacific and Atlantic Oceans and one of its main ports only 266 miles from the Panama Canal. The distance from Cartagena to the New York market is only 1,900 nautical miles.

Colombia is a large country - equal in size to the Atlantic Coast States from Maine to Florida, plus West Virginia and Ohio, and larger than France, Germany, Belgium, and Switzerland together. The area is given as 439,828 square miles, although its exact size is not known. The country is 1,100 miles long, stretching from 12° north latitude, the most northern point of South America, across the Equator to nearly 5° south latitude, and is 800 miles wide at its widest point.

Topography

The mountains are the most important single factor influencing the climate, the social and cultural pattern, the transportation, and the economy of Colombia. They cut the western part of the country from the eastern plains and divide the western part into high peaks and low valleys (fig. 1). Through their influence on the climate the mountains have determined that the major settlement of population should be in the rugged highland area. The health and vigor of the people there enable them to dominate the economic life of the country.

The Andes Mountain system, which continues up through Colombia from the west-coast countries to the south, breaks into three great ranges at the Ecuadoran border. The three arms spread out fanwise across western Colombia from south to north, forming the Western, Central, and Eastern Cordilleras.

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FIGURE 1.

Climate and Rainfall

All of Colombia is in the Tropics; nevertheless, it has widely different kinds of climate - from the heat and humidity of the coastal plains to the piercing cold of the snowy mountains. Temperature is a matter of elevation and varies little from season to season. The mountains divide the country into climatic zones, roughly segregated as follows:

(1) Tropical zones, from sea level to 4,000 feet. The mean annual temperature is about 83° F. in the daytime and 75° at night. On the northern coast the rainfall is light, sometimes not exceeding 12 inches. To the westward there is more and more moisture, and on the Pacific coast rainfall is heavy and almost continuous.

The mountains determine the river systems. In the northwestern part of the country the rivers flow north between the mountain ranges, the major ones emptying into the Caribbean. In the eastern llanos and selvas they flow east to the Orinoco and southeast to the Amazon. The largest and most important river is the Magdalena, which originates far to the south, where the Eastern and Central Cordilleras separate, and flows in the great valley between them to the Caribbean Sea. It is more than a thousand miles long, and together with its tributaries makes up the major transportation system of the country.

Almost two-thirds of the total area of Colombia lies east of the easternmost Cordillera. In the northern part of this region are the llanos, or grasslands, covered by natural grasses, and in the south are the selvas, or dense tropical jungles.

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(2) The subtropical zones on the lower mountains, ranging from 4,000 to 7,500 feet. Mean annual temperatures are 75° F. (daytime) and 63° (night). The precipitation varies with the altitude and exposure, the western slope of the Central Cordillera receiving from 45 to 75 inches of rain a year.

(3) The temperate zone, or highland area, from 7,500 to 10,000 feet. Mean temperatures on the plateaus are 63° F. (daytime) and 30° (night). The rainfall averages about 40 inches a year.

(4) The páramo, or cold region, above 10,000 feet. The páramo is an area of perpetual cold, subject to light, frequent rains.

### Soils

Soil types throughout Colombia also vary with altitude. Along the lowlands of the Pacific coast and in the Atrato Valley, the fertile soils support dense mangrove swamps but are useless for agriculture because of the unhealthy swamp, which discourages cultivation. In the lower Magdalena Valley soils vary from sandy loam to heavy clay - fertile and well-drained. To the east of the Magdalena lowlands rises the Sierra Nevada de Santa Marta; the lower elevations contain fine sandy loam deposited by the mountain streams, ideal soil for the cultivation of the banana. The soils of the Cauca Valley, which lies between the Western and Central Cordilleras, are of alluvial, or lacustrine, origin and consist of sandy loam to fine clay, light brown to gray in color, with a yellowish-gray subsoil.

From the valleys into the coffee country on the slopes of the Cordilleras, the soils remain fertile, of good depth, and high in potash and iron. Farther up the slopes on the sabanas around Bogotá, the soils are fine loam to heavy clay, but of low fertility.

### Mineral Resources

Colombia is rich in mineral resources - emeralds, gold, petroleum, silver, copper, platinum, mercury, iron, lead, mica, salt, and coal. Gold had been the source of greatest mineral wealth until the last decade, when petroleum took the lead. The average value of exports of gold, petroleum, and platinum in recent years indicates their relative importance in the trade, although gold exports also reflect balance-of-payment as well as commodity values.

Average value 1938-40  
Thousand pesos

|                |        |
|----------------|--------|
| Petroleum .... | 36,343 |
| Gold .....     | 33,732 |
| Platinum ..... | 932    |

### Forest Resources

Dense forests cover from 50 to 60 percent of the total area of Colombia (from 150 to 175 million acres), particularly in the eastern selvas and in the Pacific-coast regions. They are of four types: mangrove woods on the Caribbean coast; dry, thorny forests of the Goajira Peninsula; tropical forests on the coasts and along the rivers up to an elevation of 5,000 feet; and oak, pine, walnut, and willow forests that grow higher on the mountains. There are also large numbers of tagua palms (vegetable ivory



trees, used, among other things, to make buttons); balatas (a type of rubber tree); ceibas (silk-cotton trees that furnish kapok); capaiferas (yielding copaiba); sapodillas (the source of chicle); balsams; dye woods; and some rubber trees. The forests also contain medicinal plants, including cinchona, the source of quinine; rotenone-bearing roots, used as insecticides; tanning agents, such as divi-divi; carnauba wax; and quiku resin, as well as many varieties of rare and beautiful orchids. The jipijapa, a palmlike plant that grows wild in the forest regions, furnishes the toquilla fiber for the manufacture of panama hats.

### People

The mountains of Colombia have had tremendous influence on the people and where they live. Approximately three-fourths of the people live in the highlands and very few on the great eastern plains. There are nearly nine million people in Colombia - fewer than live in the State of Pennsylvania. The population density for the country is less than 20 per square mile, but the people are so highly concentrated in certain areas, notably the highland heart, that this average figure has little meaning.

Approximately 30 percent of the population is urban; however, this classification includes all towns having more than 1,500 people, so that many rural communities are included. Bogota, the capital, has 352,000 inhabitants, and there are only three other cities with a population of 100,000 or more.

Estimates of the racial composition of the population vary widely. Half the people are mestizos (mixture of white and Indian) 30 to 35 percent are Negro and mulatto, 10 to 15 percent are Indian, and about 10 percent are white.

### Government

Colombia has been a republic since 1821. The Government is divided into three branches; executive, legislative, and judicial. The area is divided politically into 14 Departments, 4 Intendencias, and 6 Comisarias, the last two categories resembling territories that have not reached the status of a department.

### Industrial Development

Colombia is not an industrial nation, and the industries it does have are centered in the highlands. There is a wide variety of manufacturing plants, practically all engaged in the production of consumer goods. Recently manufacturing has increased by 50 to 80 percent under the stimulus of a high protective tariff. It is estimated that the factories employ about 300,000 skilled laborers and support 1.5 million people.

### Transportation

It is on transportation that the mountains have had their greatest influence. The Andean ranges are so lofty and the few so-called passes in the mountains are themselves so high that construction of railways and highways across them is both difficult and costly. The whole eastern llano and selva region is cut off by the mountains from the west of the country and also from an outlet to the sea. The rivers that flow between the ranges furnish an outlet for the interior valleys, but communication between



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the valleys across the peaks of the Andes has been practically impossible. The airplane is the only means of travel in Colombia that is at the same time reasonably certain and moderately swift.

The Magdalena River and its 500 tributaries has been the heart of the transportation system of the country since colonial days. It affords over 2,500 miles of more or less navigable waterways. There are only 2,039 miles of railroads, concentrated largely in the Magdalena Valley. As a rule the highways have paralleled the railroads, competing with the rails for traffic, rather than complementing them to furnish a more adequate transportation system. In 1938 there were 7,668 miles of highway in Colombia, with another 1,737 miles under construction.

Most freight is moved by river boat and steamer, and a good part of the passenger travel is by air. The development of air freight service would provide a rapid and economical movement of freight as well as people, and enable the development of areas now almost inaccessible to the rest of the world.

AGRICULTURE

Agriculture today provides the major source of income for Colombia. The Spanish conquistadores, however, were not much interested in developing the country's agriculture. For them colonization was incidental to the search for minerals. They came to the New World to find gold and emeralds to take back to Spain and enjoy. During the colonial period and for 50 years after Colombia won its independence, agricultural production provided only food and fibers needed for local use. About 1850 coffee and banana cultivation developed. They are now of major importance in Colombian commerce.

Importance to the Economy

Today the economy of the country is largely agricultural and tied very closely to the coffee industry, which provides the major item of commerce. For 60 years agricultural products have constituted the bulk of exports. The two products, coffee and bananas, are by far the most important agricultural items that enter trade. Together they have accounted for from 40 to 85 percent of the total export value in recent years. When only merchandise exports are considered, the proportion represented by these two commodities is increased. Colombia ranks second to Brazil in supplying world coffee and first in furnishing mild coffee. It has supplied about 15 percent of world exports of coffee and from 5 to 10 percent of world exports of bananas.

There are no data on the total capital investment in agriculture, but the export value of coffee alone in 1938 was approximately 50 million dollars, compared with a total capital investment in the major manufacturing industries of about 39 million dollars. Corn was the next most valuable product, the total harvest being valued at 15 million dollars in that year.

Description of Agricultural Industry

The topography of Colombia is again brought to the attention by the agricultural pattern of the country. The mountain ranges divide the country into biological

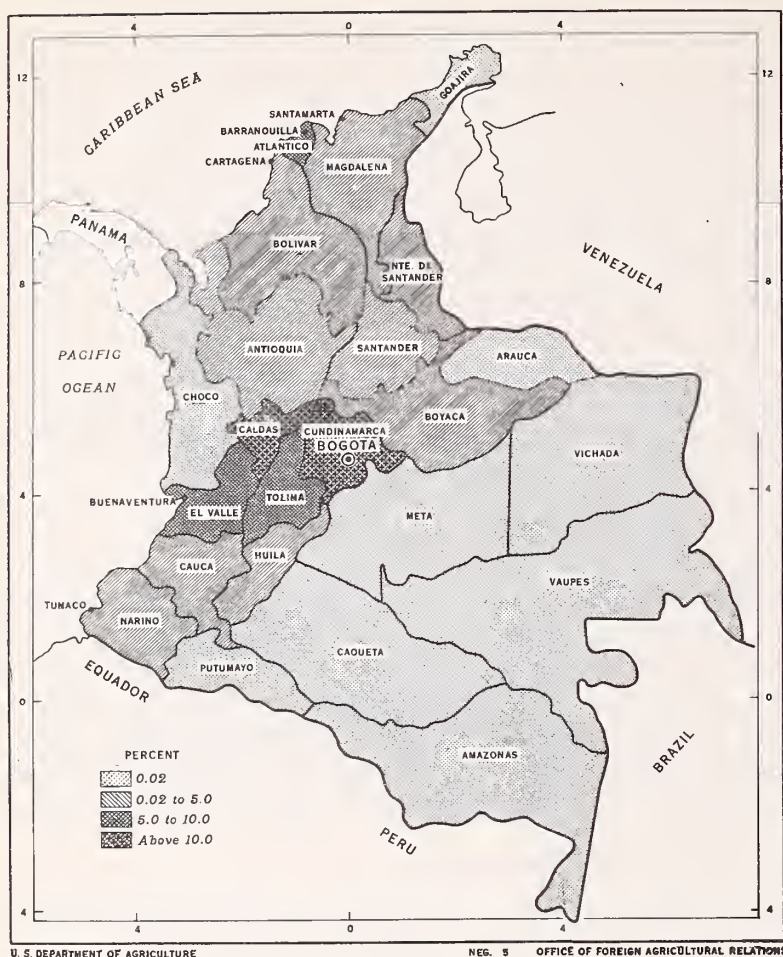


FIGURE 2.—Map of Colombia showing percentage of total land area under cultivation in each Department.

now available. Neither are there figures available on the distribution of total land area in Colombia. Certain estimates have been made indicating that forests cover 150 to 175 million acres of land, or from 50 to 60 percent of the total land area. There are at least 2.5 million acres in oil concessions and about 65 million acres in grazing land. The total area in 12 important crops in 1937-38 was $4\frac{1}{2}$ million acres, or only 1.6 percent of the total land area. In the whole eastern section containing 167 million acres, or 59 percent of the total, only 30,000 acres were planted in the crops listed. From available data, the following estimates of land utilization are made:

	Percent
Forest or woodland	50 to 60
Grazing lands	23
Oil concessions	1
Cultivated area	2
Unknown	15 to 25

Agricultural surveys indicate that there are fertile lands not yet under cultivation, especially in the Cauca Valley, the Tolima Valley, and the northern plains

islands with different plant and insect life in each area; the elevation determines climatic conditions; and growing conditions are different from one elevation to another. The extremely difficult task of moving products from one region to another has tended to develop regional self-sufficiency in the production of staple foodstuffs, even though there is certain specialized production for commerce suitable to particular regions. With the varied climatic and soil conditions, it is possible to have tropical, subtropical, and temperate crops in different parts of the country.

Arable land

An accurate statement on the amount of land actually under cultivation or capable of being cultivated is not

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section, although there are no estimates as to total area available. The two Departments of Cundinamarca and Caldas have the highest percentage of their land under cultivation, 12.7 and 11.2 percent, respectively, of their total land area.

### Type of farming

Agricultural crops are produced both for export sale and for home use. Farms producing commercial crops also grow food for their workers, and many small plots are devoted entirely to subsistence farming. The subsistence agriculture is generally extensive and commercial production intensive, although these terms cannot be applied as explicitly to Colombian agriculture as they can to the agricultural production of the United States. High-cost spraying and irrigation equipment in the banana fields is forcing a more intensive use of the land there than formerly. A few years back, older producing areas were abandoned and production started on new land. This practice is still used to some extent but in a much more limited area.

The topography of Colombia has produced many regions of agriculture, through its effect on climate and transportation facilities. There are, however, four general agricultural areas:

(1) The tropical region - including the Atlantic and Pacific coasts and the Magdalena Valley as far south as Girardot. Although the eastern plains and forests are tropical in climate, they are not yet important agriculturally. Commercial banana cultivation is centered on the Atlantic coast and in the Magdalena Valley. Other important north-coast products include cotton and sugarcane. The farmers produce corn and rice for home use, and some cacao and vegetable ivory, or tagua. Cattle graze on the plains south of the Sierra Nevada and along the river banks. This region produces some coconuts, tonka beans (used as a substitute for vanilla), sapodillas (large brown fruit with sweet brown flesh from the tree that produces chicle), grapefruit, limes, mangoes, papayas, and avocados. These are not now commercially important, but may develop into profitable production.

There is not much commercial agriculture along the Pacific coast, although the region does produce some rubber and tagua for trade. Some sugarcane, rice, and cotton are grown there, but cultivation is very haphazard and primitive. The natives produce plantains, corn, yuca, and a few hogs for local consumption.

(2) The Cauca and Tolima Valleys. The Cauca Valley is one of the best agricultural regions in the world. It is especially suited for the production of cotton, sugarcane, and cacao. The higher lands on either side of it produce excellent coffee. The valley has good grazing lands, and in the past the people there have been more interested in grazing than in the cultivation of crops. However, in recent years they have begun to recognize the possibilities of expanding agricultural production there. The Tolima Valley is suited to the production of cotton, tobacco, rice, as well as coffee. Semitropical fruits can be grown, such as limes, grapefruit, pineapples, sapodillas, avocados, and mangoes.

(3) The third section includes land from 4,000 to 7,500 feet above the sea. This area specializes in the production of Colombian mild coffee. Each coffee finca, however, produces also some corn, yuca or cassava, beans, and some Temperate Zone vegetables. Cattle grazing is highly developed, especially around Medellín. This elevation is particularly suitable for cacao, quinine, digitalis, and tea.



(4) From 7,500 to 10,000 feet elevation - including the Sabana of Bogotá, parts of Boyacá, and Santander. Some coffee is grown here as well as other Temperate Zone products, including wheat, barley, potatoes, apples, pears, and peaches. Fine cattle are raised on the Sabana of Bogotá.

Climatic and soil conditions pretty well limit the producing regions for some crops. There is not much competition as yet between crops for the use of the same land, although a thorough study of the relative advantages of growing one crop as against another in certain localities might provide the basis for a redistribution of land use. It might be found that land now being used for cotton could more advantageously be devoted to sugarcane, coconut palms, or Manila hemp; or that land in wheat might better be used for forest or orchard crops that would conserve the soil.

#### Equipment and labor

Agricultural equipment in Colombia is generally meager. Prior to 1934, agricultural machinery was used very little in the cultivation of any crop. Since then, the Government has been encouraging the development of self-sufficiency in foodstuffs, and the large cultivators of rice, cotton, wheat, barley, corn, and potatoes have turned more and more to the use of machinery. The hoe and the machete are the most common instruments used in cultivation. The machete is a universal tool and is carried constantly by the people in the country regions. Plows are used extensively only in the Cauca Valley, on the Sabana of Bogotá, and on a few cotton plantations in the Department of Atlántico.

Since so many of the farms in Colombia are small, family-sized farms, the major portion of the work is done by members of the family. There is very little need for hired farm labor. There is, of course, a large force of hired labor in the banana fields of Santa Marta. The oxen that are used to draw the plows and other equipment are the most important source of power among the small farmers. Few horses or mules are used. On the larger farms tractors with gasoline motors are common.

#### Marketing mechanism

There are no organized spot or futures commodity markets in Colombia. The marketing system is different for the two commercial crops, coffee and bananas, from that for products raised for domestic consumption. Coffee is handled largely through the National Federation of Coffee Growers, which buys the coffee direct from the growers and makes all the arrangements for selling it abroad. Some coffee is handled by American concerns who have agents in the coffee country to buy direct from the growers. As for bananas, practically the entire Santa Marta crop, whether grown by private planters or the Magdalena Fruit Company, is marketed through the Fruit Company, which picks up the fruit at stated points along the company-owned railway and handles all arrangements for sale abroad, including the shipping of the fruit in its own boats.

The products that do not enter into foreign trade are usually sold in the larger towns at open-air markets, which are held every week in some localities and more or less often in others. There is little movement of commodities from one section of the country to another, especially from one valley to another or between the highlands and the low country, because of the difficult and high-cost transportation.

## Crop and livestock Pattern

The crop pattern of Colombia is made up of crops grown largely for export, subsistence food crops, and crops grown largely to supply raw materials for domestic industries.

The predominantly important commercial crop is coffee, which furnishes half the total value of all exports. Bananas are also important in export trade and furnish a staple article of the diet in the tropical and subtropical regions.

There is very little export of other cultivated crops, although many forest products find a good market abroad. Forest products grow in their natural state at present, and the harvest is largely a matter of going into the forest and picking or gathering the product. There has been wide variation in the quantities thus harvested. The more important forest products are rubber; toquilla fiber for making straw hats; tagua, or vegetable ivory; divi-divi, a tanning agent; and different woods, including medicinal balsam.

From the standpoint of the domestic food supply, corn is the most important crop. It is grown on practically every farm in Colombia and occupies more acreage than coffee. Other important food staples are beans, rice, wheat, sugar, cacao, and copra. Colombia is practically self-sufficient in the production of corn and beans, but must supplement domestic production of rice, wheat, sugar, cacao, and copra by sizable imports from abroad. The physical and economic conditions of Colombia offer possibilities for becoming self-sufficient in the production of copra, cacao, sugar, and rice. Government or other aid would need to be extended, especially for copra and cacao, which are both tree crops.

TABLE 1.—*Acreage and value of production of major crops in Colombia, 1937-38*

| CROP                       | VALUE         | ACREAGE     |
|----------------------------|---------------|-------------|
|                            | 1,000 dollars | 1,000 acres |
| Coffee <sup>1</sup> .....  | 49,670        | 968         |
| Corn .....                 | 15,296        | 1,362       |
| Potatoes .....             | 9,486         | 167         |
| Wheat .....                | 5,990         | 493         |
| Sugar <sup>2</sup> .....   | 5,444         | 673         |
| Rice .....                 | 5,231         | 151         |
| Bananas <sup>3</sup> ..... | 4,971         | 150         |
| Cacao .....                | 3,356         | 81          |
| Beans .....                | 3,253         | 178         |
| Cotton .....               | 1,973         | 107         |

<sup>1</sup> Export value. No coffee census has been taken since 1932. The National Federation of Coffee Growers of Colombia has arbitrarily added 10 percent to the 1932 figures to obtain the 1938 acreage.

<sup>2</sup> Value of product of commercial sugar mills only.

<sup>3</sup> Commercial area of Santa Marta only.

[Colombia] Dir. Nac. de Estadís., An. Gen. de Estadís. 1937; [Colombia] Min. de Econ. Nac., Inform. del Dep. Agr., Mem. 5., 1939.

The two most important raw-material crops grown in Colombia are cotton and tobacco. Domestic production of these crops furnishes the major portion of the raw material for Colombia's two most important industries. Although the climate and soil seem favorable for cotton growing, pests and diseases destroy a large part of the crop. More study of the relative advantages of expanded cotton growing as against other possible uses of the land seems indicated. Figue, a hard fiber used primarily in the manufacture of bags, is becoming an increasingly important raw material.

By far the most important livestock produced in Colombia are cattle. Cattle raising has been one of the principal industries since colonial days. Hog raising has never developed to any extent in this country, although hogs thrive on the slopes of the Central and Eastern Cordilleras. It is difficult to obtain accurate data on livestock numbers in Colombia, but the relative importance of the different types of livestock for selected years is indicated in table 2.

TABLE 2.—Livestock numbers in Colombia, selected years

| YEAR                                                                           | CATTLE | HOGS    | SHEEP   | GOATS | HORSES  | MULES | ASSES |
|--------------------------------------------------------------------------------|--------|---------|---------|-------|---------|-------|-------|
| : Thousands: Thousands: Thousands: Thousands: Thousands: Thousands: Thousands: |        |         |         |       |         |       |       |
| 1916 .....                                                                     | 4,832  | : 1,139 | : 246   | : 232 | : 858   | : 324 | : 168 |
| 1925 .....                                                                     | 6,476  | : 1,366 | : 780   | : 407 | : 978   | : 354 | : 138 |
| 1930 .....                                                                     | 7,343  | : 1,434 | : 810   | : 427 | : 929   | : 329 | : 149 |
| 1934 .....                                                                     | 7,972  | : 1,622 | : 872   | : 544 | : 972   | : 476 | : 303 |
| 1937 .....                                                                     | 7,592  | : 1,545 | : 831   | : 518 | : 926   | : 453 | : 288 |
| 1938 .....                                                                     | 8,112  | : 1,600 | : 1,000 | : 600 | : 1,000 | : 500 | : 305 |
| :                                                                              | :      | :       | :       | :     | :       | :     | :     |

Official statistics.

The estimated value of the livestock in Colombia in 1938 is shown below by classes. Cattle were almost seven times as valuable as horses, the next most valuable group.<sup>1</sup>

|               | Million dollars |
|---------------|-----------------|
| Cattle .....  | 157.3           |
| Horses .....  | 23.4            |
| Mules .....   | 15.8            |
| Hogs .....    | 7.2             |
| Asses .....   | 2.5             |
| Sheep .....   | 2.6             |
| Goats .....   | 0.9             |
| Poultry ..... | 2.5             |
|               | <u>212.2</u>    |

### Coffee

The coffee industry occupies the place of first importance in the economy of Colombia. The welfare of every citizen is touched by its influence, either directly through work in the coffee plantations or indirectly through its effect on the external purchasing power of the country.

The coffee tree was first introduced into Colombia in the eighteenth century. It thrived on the lower mountainsides, but production expanded slowly until the middle of the nineteenth century. Since that time, coffee growing has spread rapidly,

<sup>1</sup> [Colombia] MINISTERIO DE LA ECONOMÍA NACIONAL. INFORME DEL DEPARTAMENTO DE AGRICULTURA. Mem. 5, 76 pp., illus. 1939.



and the trend of production has risen tremendously in recent years. The 1940 production was well over  $4\frac{1}{2}$  million bags, or almost 600 million pounds of coffee.

### Importance of coffee

*In the economy of the country* - The economy of Colombia is tied closely to its one big export crop - coffee. Since the latter part of the nineteenth century, coffee has been the principal article of foreign trade. As coffee exports have increased, Colombia as a nation has advanced. Barring unforeseen developments, the fate of coffee will determine to a high degree the fate of Colombia.

The coffee industry represents a large proportion of the national resources, with an estimated investment of 250 million pesos (about 142 million dollars). Practically all of this wealth is owned by native Colombians.<sup>2</sup> Approximately one-fourth of the entire population depends directly on coffee growing for a livelihood, and the fortunes of the industry indirectly affect the welfare of the remaining three-quarters.

A major portion of the coffee is produced for export, the domestic consumption in 1940 running only 400,000 bags out of a total production of over  $4\frac{1}{2}$  million bags. Colombia must import most industrial products as well as large quantities of food-stuffs and raw materials to supplement domestic production. Coffee exports provide most of the exchange with which to pay for these imports.

Coffee is by far the most important single commodity export. It has represented well over half the total value of all exports in most years, although the trend of its relative importance has declined. From 1906 to 1924 the general trend was upward, rising from slightly over 40 percent of the total value to almost 80 percent of the total. Since then its relative importance has been declining, partly because of the lower unit price of coffee exports and partly because of the spectacular rise in petroleum exports. In 1940, however, the value of coffee exports still accounted for 49 percent of the total export value.

*In world supply* - Since 1920 Colombia has supplied a significant proportion of world coffee requirements and today ranks second to Brazil as a source of coffee. During the past 10 years it has produced about 11 percent of the total world supply, furnishing approximately 15 percent of world consumption and from 20 to 25 percent of United States consumption of coffee. Colombia is the leading producer of mild coffee, which is much in demand to blend with Brazilian coffees. The consumption of mild coffee has almost doubled in the past 15 years, and Colombia has supplied almost one-third of this mild type.

### Description of the industry

The coffee beans that furnish the breakfast beverage in many American homes are the fruit of the semitropical coffee tree. The quality of the beans depends on the soil, climate, elevation, and care in tending the trees. The people in Colombia's coffee country take pride in the distinctive quality of their product and take pains to protect its good name in the market by careful grading practices. The coffee grown there has a heavy body and a delicious aroma and flavor, which make it valuable for

<sup>2</sup> NATIONAL FEDERATION OF COFFEE GROWERS OF COLOMBIA. THE COFFEE INDUSTRY IN COLOMBIA. 28 pp. London. 1933.

blending. It contains a large proportion of oil and has a high caffeine content, a low weight of ash, and a uniform green color of berries.

*Size and location* - Coffee production follows the upland slopes of three mountain ranges, the most important producing areas being on both sides of the Central and on the west side of the Eastern Cordillera. There is some commercial production on the northern and western slopes of the Sierra Nevada de Santa Marta, and small quantities are grown on the western side of the Western Cordillera. The best Colombian coffee is grown on hillsides ranging from 3,000 to 6,000 feet above sea level, and the Departments having areas within these limits are the important producers today. Caldas furnishes almost a third of the total output, and Antioquia, Cundinamarca, Valle, and Tolima each furnishes from 10 to 17 percent of the total. During the past 20 years the producing regions have shifted to the west somewhat, and the relative importance of the different Departments in supplying the market has changed.

Colombians believe that the most flavorful coffee can be grown in the spring-like climate of the lower mountain regions where the rainfall is well distributed and regular and the temperature is warm and uniform, ranging from 60° F. at night to 80° during the day. The soils are of volcanic origin, are deep and fertile, and are ideally suited to coffee culture. The salty volcanic-ash soil of Antioquia is noted particularly for its flavor-giving qualities.

There are just under a million acres of the Colombian hillsides devoted to coffee trees, although it is estimated that at least 10 million acres are suitable for growing fine coffee. Approximately 150,000 plantations raise coffee. A few of them are large, but a good portion of the coffee is grown on small farms, or fincas, varying in size from 2 to 25 acres. The average area in coffee is less than 6 acres per farm, and the average number of trees per farm 3,556. The plantations vary in size in the different districts. Generally speaking, they are small in the Central Cordillera and much larger in the Eastern Cordillera and in the Tolima Valley. In 1932 (the last coffee-census year) 87 percent of the coffee plantations on an average had less than 5,000 trees and produced only 40 bags of coffee a year. Only 321 plantations, or 0.2 percent, had more than 100,000 trees and produced an average of 800 bags of coffee a year.<sup>3</sup> Compared with Brazil, where plantations with several million trees are not uncommon, even the larger plantations of Colombia look small.

*Grades and types of coffee* - The names of the different types of coffee in Colombia have come from the chief market centers where the coffee is sold. The Manizales, Medellín, and Armenia coffees are by far the most important in the trade, accounting for 55 percent of the total. The Medellín from the Department of Antioquia bring the best price on the market. Antioquia has gone far in standardizing its product and is building a fine reputation for Medellín coffees. There are several different grades of coffee within each type classification. The Medellín are divided into five grades: Excelso, Primera, Caracol, Segunda, and Consumo. About 75 percent of the crop is Excelso, the top grade. The Manizales coffee from the Department of Caldas is divided into Excelso, about 90 percent of the total, and Consumo. Other types are divided into two and sometimes three grades. The Excelso grade makes up about 90 percent of all the coffee exported from Colombia.

<sup>3</sup> FEDERACIÓN NACIONAL DE CAFETEROS DE COLOMBIA. CENSO CAFETERO LEVANTADO EN 1932. Bol. de Estadís., Bol. Extraordinario, v. 1, No. 5, 156 pp. 1933.



The National Federation of Coffee Growers is responsible for establishing the standard grades, and it inspects all coffee exported for proper classification, grade, and markings.

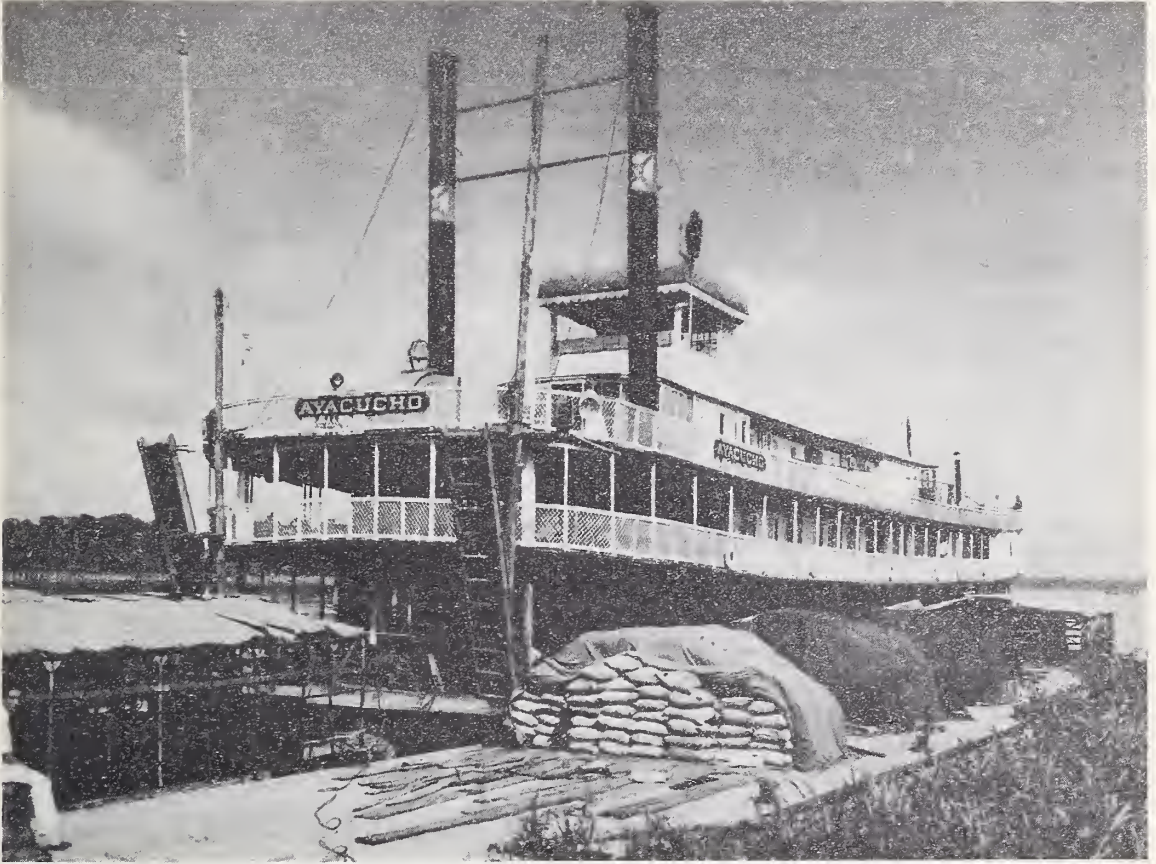


FIGURE 3.—Loading coffee on the lower Magdalena River.

*Transportation* - Transportation over the whole of Colombia is quite inadequate and the movement of the coffee crop is hampered by the lack of modern methods. The majority of the coffee plantations are located on steep and rugged hillsides a good distance from rivers, railways, or roads. Most of the coffee moves from the farm to the railways, cableways, etc., by mule pack or oxcart over narrow mountain trails. The product is loaded and reloaded many times before it reaches the port of embarkation. The Magdalena River serves as the principal means of carrying the product to seaports. Coffee taken by rail, road, cableway, and mule pack is unloaded along the river bank to wait for the steamer going down the river. The uncertainties of the river make it impossible to determine when the coffee will reach port. When the river is high, it moves fairly well, although even then the coffee from the highland region must be reloaded from the small upstream boats to the larger steamers on the lower Magdalena and the trip requires at least a week. In the dry season it sometimes takes 5 or 6 months for a shipment of coffee to travel from the farm to port.



A little over half the coffee is moved to ports on the north coast, most of this coffee coming down the Magdalena River. The Antioquia Railway, La Dorada Railway, and the Puerto Wilches Railway carry the coffee to points along the river, where it is loaded onto the steamers for the journey to the sea. A little coffee from the Sierra Nevada de Santa Marta region travels by rail to the port cities. The Pacific port of Buenaventura has become increasingly important in recent years with the establishment of the railways from the highland region to the Pacific, and more and more coffee moves over this route on the Pacific Railway and Caldas Railway.



FIGURE 4.—Coffee warehouse in Buenaventura.

When the coffee reaches port, it is transferred to ocean steamers by dock hoists or ship's tackle. Coffee is usually not held for any length of time at the seaports, although there are Government warehouses in Barranquilla and Buenaventura where the coffee may be stored for a time. Coffee is a product that can be stored for relatively long periods without deteriorating, if protected from the weather. However, there has never been a need for prolonged storage from one season to another, since the crops have ordinarily moved to market currently.

#### Foreign trade

*Historical trends*- Coffee, which was destined to become the most valuable item in Colombia's trade, was first exported in 1835. By the middle of the nineteenth century the production and exports had increased considerably, and by 1880 coffee had

become the principal article of foreign trade, although it was not until 1920 that Colombia became an important factor in the world supply of coffee. Coffee is now produced primarily for the export market - a market which has been expanding steadily during recent years. The tremendous increase in the exports of coffee over the past hundred years is shown in table 3.

TABLE 3.-Exports of coffee from Colombia, 1835-1940<sup>1</sup>

| YEAR       | QUANTITY          | YEAR       | QUANTITY       |
|------------|-------------------|------------|----------------|
|            | : 1,000 pounds :: |            | : 1,000 pounds |
| 1835 ..... | 344               | 1895 ..... | 47,399         |
| 1845 ..... | 3,164             | 1905 ..... | 66,246         |
| 1855 ..... | 4,550             | 1915 ..... | 149,452        |
| 1865 ..... | 8,519             | 1925 ..... | 257,506        |
| 1875 ..... | 10,055            | 1935 ..... | 493,550        |
| 1885 ..... | 14,665            | 1940 ..... | 587,729        |
|            | :                 |            | :              |

<sup>1</sup> The Coffee Industry in Colombia and various issues of An. de Econ. y Estadis.

Exports show a striking upward trend during the present century (table 3). Since more than 90 percent of the total output is exported, this table indicates the trend in production as well as exports.

*Destination of exports* - The United States has been the largest market for Colombian coffee, taking from 70 to 97 percent of the total. Coffee comes into the United States free of duty, and by the terms of the reciprocal trade agreement signed with Colombia in 1934 coffee is bound on the free list.

The United States market for Colombian coffee has grown steadily for many years, increasing with the total exports of coffee from Colombia, except for a leveling off during the middle 1930's. The trend in the relative position of the United States as a market for Colombian coffee shows a decided dip during the middle 1930's, rising again in 1938 and 1939 and shooting much higher in 1940. The rise in both the absolute and the relative quantity taken by the United States in the World War of 1914-18 is being repeated again as a result of the current conflict.

TABLE 4.-Percentage distribution of Colombian coffee exports by major markets, selected years<sup>1</sup>

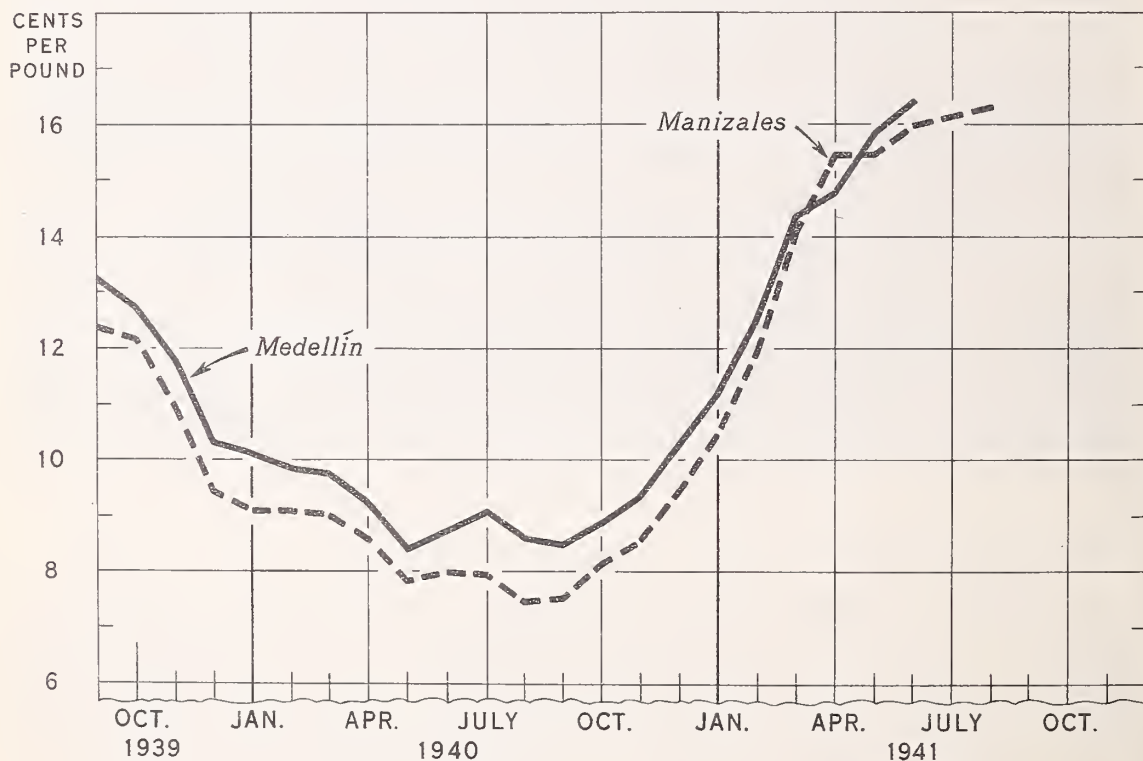
| YEAR       | UNITED STATES | EUROPE  |
|------------|---------------|---------|
|            | Percent       | Percent |
| 1915 ..... | 88.1          | 10.6    |
| 1916 ..... | 96.7          | 2.1     |
| 1917 ..... | 87.7          | 12.2    |
| 1918 ..... | 89.0          | 10.7    |
| 1919 ..... | 93.1          | 6.7     |
| 1925 ..... | 94.5          | 5.2     |
| 1930 ..... | 91.6          | 7.1     |
| 1932 ..... | 88.1          | 11.0    |
| 1934 ..... | 83.1          | 15.2    |
| 1936 ..... | 70.8          | 26.1    |
| 1938 ..... | 78.9          | 17.4    |
| 1939 ..... | 83.5          | 11.6    |
| 1940 ..... | 93.6          | 1.4     |
|            | :             | :       |

<sup>1</sup> Fed. Nac. de Cafeteros de Colombia, Bol. de Estadis., December 1940.

The European market was increasing in relative importance in the years prior to the present war, the proportion of the total reaching 26 percent in 1935. Germany led in this increase, in some years taking over half the coffee shipped to European markets. In 1940, however, Europe took only 1.4 percent of total coffee exports, and the United States' share jumped from 83 percent of the total in 1939 to 94 percent in 1940. Division of the market for Colombian coffee between the United States and Europe for selected years is shown in table 4.

*Effect of current war* - Until the beginning of the current war there had never been a carry-over of coffee from one season to the next, as there has in Brazil. The uniformly high quality of the product has apparently been a major factor in holding up the demand even in years of low purchasing power. As the European markets dwindled through 1940, stocks began to accumulate for the first time in Colombia.

The United States and Canada have been almost the only markets for coffee shipments during the war months. The proportion of total exports taken by the United States has been about 90 percent each month since September 1939, and in June 1941 the United States took 99.9 percent of total coffee shipments.



SOURCE: ANALES DE ECONOMIA Y ESTADISTICA; COFFEE STATISTICS, PAN AMERICAN COFFEE BUREAU

FIGURE 5.—Price of the two best grades of Colombian coffee on the New York market, 1939-41.



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Prices

Historical trend- Colombian coffee has always sold at a premium over Brazilian coffee in world markets because of its mild flavor and superior quality. Practically all the export grades have topped prices of the Brazilian product in the New York market, and the price of the more important Medellín and Manizales coffees has been significantly higher. In general, coffee prices have followed the general cycle of raw-material prices. They reached high peaks in 1920 and again in the middle 1920's, with low prices in 1921 and during the depression years of 1930. In common with prices of other raw materials and the agricultural price level, coffee prices started their downward spiral in 1929, ahead of the general business slump.

The trend of the unit export price expressed in United States currency follows very closely the New York market prices for Medellín and Manizales, although the average price is, of course, somewhat lower, since it includes the lower-priced grades. Insofar as the coffee planter in Colombia uses his income to purchase imported goods, it is the price of coffee in United States currency that determines how much of the foreign product his coffee crop will bring him. During recent years the lower price of coffee has made it necessary for him to ship larger quantities of his product to obtain the same amount of purchasing power as during the middle 1920's.

Effect of the war - Following the outbreak of war in Europe, the price of coffee, including that for Colombian grades, declined steadily through the summer of 1940. Figure 5 shows the rapid month-by-month decline in the New York price of the two top grades of Colombian coffee through May of 1940, and the continued low level during the following summer.

In the fall of 1940 the Colombian Government decided to take definite steps to stop the downward movement in prices. In November an "official" price was set in Colombia for all grades of coffee and the internal price maintained by purchases through the National Federation at this price. From November 1940 until March 11, 1941, the official price was increased 11 times, the increases ranging from 25 to 45 percent. In November the International Coffee Agreement was signed by the coffee-producing countries. The agreement tended to strengthen the price of coffee and, together with the governmental control measures in Colombia, influenced the New York quotations on Colombian grades. Further reference to figure 5 shows the steady month-by-month rise in the price of Colombian coffee, especially during 1941. Prices of Bogotá, Girardot, and Tolima coffees in June 1941 were twice what they were in June 1940.

Until the beginning of the present war there had been no valorization, establishment of quotas, or other measures to control production and price of coffee, nor had there been a need for them. Colombian coffee had been much in demand to blend with other coffees, particularly in the United States market. Government action had been centered in aiding in the establishment of the National Federation of Coffee Growers, a semiofficial agency, which attempts to coordinate the various parts of the coffee industry. The Federation is composed of planters, brokers, and bankers interested in coffee. It was formed in 1928 under the authority of a law of 1927 and works under a contract with the Government. The Government is represented on the Control Board of the Federation, and the policies of the two are closely allied. The Federation has been enabled to carry on its work through use of the proceeds from an export tax on coffee levied by the Government under authority of the law creating the Federation.

After the war started in September 1939, the position of the coffee-growing countries became more and more unsatisfactory. The Government studied the situation closely and made several attempts to lessen the severity of the crisis that was developing. By November 1940 they were ready with a comprehensive program for the industry. The new program was authorized by a law enacted November 21, 1940. This law, together with the decrees issued under it, regulates the coffee trade, establishes new taxes, sets up a national coffee fund of 10 million pesos to be used to purchase surplus coffee, and authorizes an internal bond issue to provide the coffee fund mentioned above. The fund is administered by a junta, or commission, which may fix an official daily price of coffee based on conditions in the foreign markets.

*International Coffee Agreement*⁴ - Even though Colombia itself has had no difficulty in disposing of its crop, at least until the present war, other coffee-producing countries, notably Brazil, have been suffering from surplus production for many years. The closing of European markets by the war has greatly aggravated their problem. Brazil had already taken steps to decrease its supplies, and international cooperation in adjusting the coffee supply to market demands had been proposed many times. During the conference of Inter-American states at Havana in July 1940 a resolution was adopted looking to cooperation among the coffee producers. During the summer of 1940, a coffee conference was held at New York to explore the possibilities of cooperation. All of the coffee-producing countries of the Western Hemisphere, as well as the United States - the chief consumer - were represented. In November the representatives of the various countries reached an agreement, which included a system of quotas covering the 1940-41 year, from October 1 to September 30. The United States consumption was estimated and quotas allocated to each of the producing countries. In addition to quotas for the United States market, quotas were established to take care of any additional markets that might be found.

Future prospects

Charting the future course of any industry is always difficult and highly uncertain, even in normal times. In the midst of an almost world-wide war, it is well-nigh impossible. There are, however, a few facts to guide us in forecasting future trends.

With the closing of the European markets to coffee from all the coffee-producing countries of the Western Hemisphere, the United States remains as the only major outlet for coffee. Coffee consumption has been increasing in Canada, and that country has been taking an increasing quantity from Colombia. However, this quantity still represents only an insignificant proportion of the available supply. Unless the peoples of the Western Hemisphere increase their consumption of the beverage, it is inevitable that coffee stocks will pile up in the producing countries. On the basis of the current quota allotment, Colombia is assured of a market in the United States for about 75 percent of the crop. With the market allocated among the producing countries, excess stocks cannot be dumped into the market to depress the price. Other things being equal, it should be possible to maintain the New York price of the bean, at least for a time. Assuming the New York price can be maintained at the relatively satisfactory levels attained in the spring and summer of 1941, Colombia's coffee

⁴ GIBBS, J. BARNARD. THE INTER-AMERICAN COFFEE AGREEMENT. *Foreign Agr.* 5:165-171. 1941.

exports will provide a fairly steady source of exchange for the purchase of goods abroad. A stable market for a major portion of the crop should aid in carrying over the increasing stocks of coffee for a few years. If the current war does not last very long, the accumulated supplies could no doubt be disposed of in Europe. Colombia, has no backlog of stocks from other years, and the position of the coffee industry is fundamentally good.

Since coffee is a tree crop and several years of waiting are required after planting before the tree produces a harvest and since it continues to produce for several years after coming into bearing, it is difficult to adjust supply to market needs. The Government is aware of its problem, however, and is working constantly to devise new and improved aids for the industry to help it weather the current difficulties. During the course of a long war, stocks are likely to accumulate and production is likely to be curtailed, as the number of new trees planted fails to keep pace with the number becoming too old to produce. The resulting decrease in the number of producing trees might tend to reduce the importance of coffee in the total economy. However, Colombia is so ideally suited for the production of fine coffee, it seems inevitable that coffee will continue to furnish the country's major source of income.

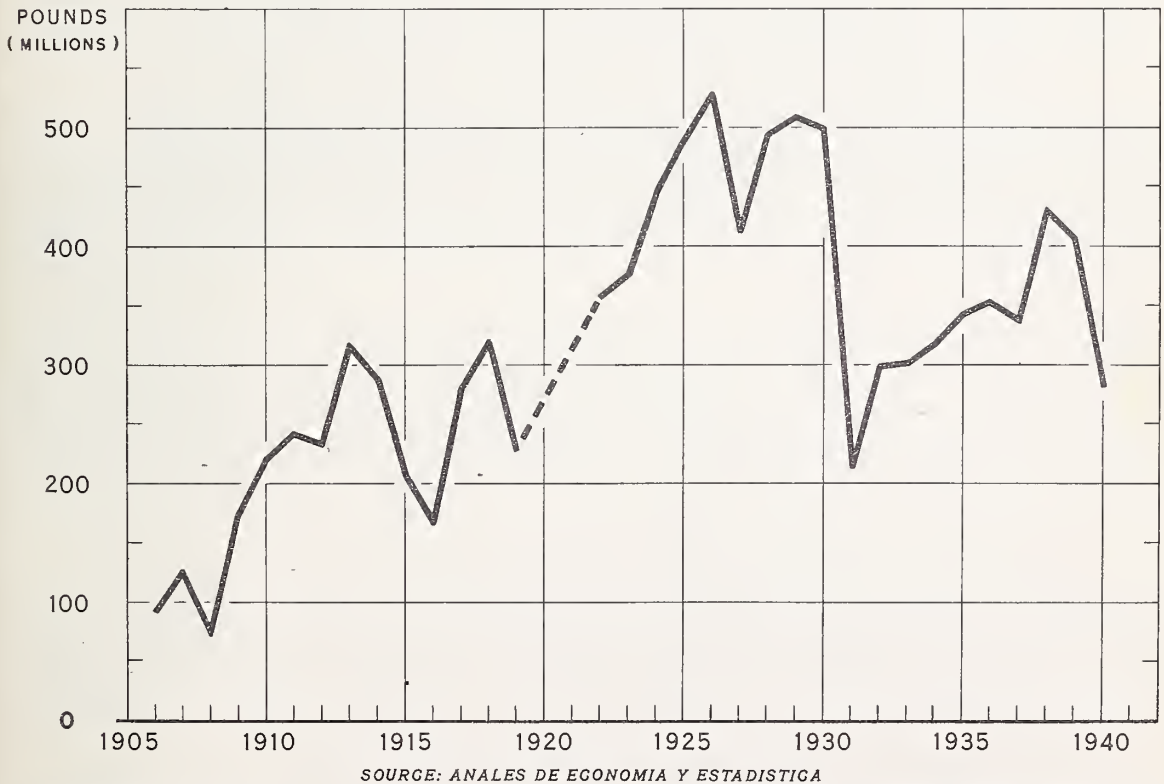


FIGURE 6.—Exports of bananas from Colombia, 1906-40.

Bananas

The banana industry in Colombia originated in the Rio Frio district about 30 miles from Santa Marta. The growth of commercial production can be seen from the export data, which show an increase in exports from 90 million pounds in 1906 to 230 million pounds in 1919 and to a peak of 525 million pounds in 1926 (fig. 6). By 1920 the total plantings had reached 30,000 acres. In recent years plantings have exceeded 150,000 acres, and the banana fields of Santa Marta are among the largest and busiest in Latin America.

Importance of industry

In the economy of the country - The banana is a staple article of diet throughout most sections. A few plants are grown in the back yard of practically every rural home, especially in the tropical and subtropical regions, to provide food for family use. In addition to the importance of the banana as a food, it is one of the major commercial crops, being the second most important agricultural export. Even though the entire commercial crop is grown in the Santa Marta district, banana exports have averaged about 6 percent of the total export value in recent years. The relative importance of banana exports has declined somewhat since the World War, although the volume of exports continued to increase during the 1920's and is still larger than during the World War period.

In world supply - The Santa Marta banana area is one of the largest in the world and has supplied from 6 to 10 percent of total world exports recently. A few years ago it ranked second to Honduras as a source of banana exports; but during the past 2 or 3 years Mexican exports have topped the list, and Colombia dropped to fourth place in 1938. Colombian exports, however, still represented 7.5 percent of the total world exports.

Description of the industry

Location - After the introduction of the banana in the Santa Marta district of the Department of Magdalena, its cultivation spread rapidly throughout the entire country. The export industry, however, is still centered in the Santa Marta district. The banana area extends about 40 miles south of Cienaga on the rich piedmont plain at the foot of the Sierra Nevada de Santa Marta.

The soils of this plain are very fertile, and good drainage makes the plain particularly favorable for growing bananas. Temperatures are high - ranging from 72° F. at night to 89° during the day. There is very little variation from month to month. Annual rainfall varies from 35 inches near Río Frío to 65 inches at Fundación. During the rainy season irrigation is not needed, but during the dry season the fields are irrigated every 30 days.

Size and number of farms - Since 1900 the Magdalena Fruit Company has owned and cultivated the major portion of the banana lands in Santa Marta. In the early days, the company owned all the banana lands, but gradually private growers have developed plantations in the Santa Marta district. By 1920 a little over half the planted area belonged to the Fruit Company and the rest was distributed among 275

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private owners. These holdings were small, few of them being as large as 1,000 acres, and most of them were from 25 to 40 acres. In recent years the proportion of the total planted area owned by the company has declined to between 40 and 45 percent.

*Pests and diseases* - The most dangerous enemy of the banana in most producing fields at the present time is the sigatoka, or chamusco disease, a fungus infection. It has not reached as dangerous proportions in Colombia as in the Central American fields, but since late 1937, when it first appeared, it has been spreading very rapidly. At first the plant experts in Colombia did not realize that the spots appearing on the banana leaves were the dreaded sigatoka, and it made a good start before steps were taken to check it.

Now that the Magdalena Fruit Company has come to realize that the disease is spreading throughout the plantations, they have taken steps to install spraying equipment such as is usual in the Central American countries. About \$50 to \$60 an acre is being spent for equipment, which includes a piping plant to each 200 or 300 acres. In every direction from the plant the plantations are laid with 4-inch, 2-inch, and 1-inch galvanized pipes through which a copper sulphate solution is carried to small distributing blocks scattered every 30 feet over the entire plantation. Laborers are then taught to attach a hose spray to the distributing points and to spray the tree and the surrounding area, covering all parts of the leaves with the liquid. The liquid is pumped through the pipes under 600 pounds pressure. The company is experimenting to learn just how often it is necessary to spray the trees, but they have not reached any definite conclusions. At present the spraying is done every 15 to 21 days.

It has been found that young plants that are sprayed from the very first do not require attention as often as do the older plants that have already become infected. It is estimated that the cost of spraying, in addition to the initial cost of equipment, runs from \$15 to \$20 a year per acre. However, if the spraying is not done the value of the land for banana production falls to almost zero, since the disease cuts production drastically.

*Labor* - The Santa Marta district is almost the only place in Colombia where there is much hired agricultural labor. Though 55 to 60 percent of the crop is grown by comparatively small independent planters, the lands of the Fruit Company are worked by hired laborers, the force averaging about 3,000. Private growers also employ laborers to work on their plantations, especially at harvesttime. About 2,500 men, on an average, are so employed. There have been numerous labor difficulties in the zone, resulting sometimes in strikes.

Numerous laws have been enacted in an effort to protect the interests of the workers and private growers. Since the Magdalena Fruit Company is the largest producer and employer of labor in the industry, the greater part of the legislation has been concerned with its activities. Companies owned by foreign capital are required to establish schools, hospitals, and health service for the workers, and a certain percentage of their employees must be native Colombians.

*Marketing* - Almost 100 percent of the commercial banana crop is marketed through the Magdalena Fruit Company, the Colombian subsidiary of the United Fruit Company. The company owns the railroad that goes from the coast back into the banana fields, as well as the ships that carry the fruit from Colombia to foreign markets. The bananas grown on private plantations, as well as on those of the company, are picked up at

the railroad siding by the company, which takes care of them from this point on. The only current expenses the private grower has are the costs of cultivation, cutting, and hauling the fruit to the loading stations along the railroad right-of-way. The overhead costs of the company include transportation, loading, supervision, etc.

## Trade

*Exports* - All during the twentieth century the Santa Marta district has exported large quantities of bananas, the peak being reached in 1926 when 525 million pounds were exported. In 1931 when depression conditions were prevalent in both England and the United States, shipments fell off to 214 million pounds. Since the entire marketing mechanism is controlled by a single organization, supply to the consuming markets could be limited readily and the course of banana exports did not, therefore, follow that of other agricultural and raw-material products.

Until recently Colombian bananas have gone principally to European markets; and, together with Jamaica, Colombia has supplied the major portion of the imports into Europe. Prior to 1932 the United Kingdom was the most important market. In that year the United Kingdom imposed a tariff on bananas produced outside the British Empire and Jamaican bananas replaced those from Colombia on the English markets in some years. There have been radical shifts in the direction of banana exports from one year to the next, and it is difficult to distinguish any very definite trends. Before the current war Germany and the Netherlands were large consumers, taking together almost 40 percent of the total. The war has, of course, eliminated them from the picture, and the United States and the United Kingdom are now the principal markets.

Colombia has supplied from 4 to 6 percent of United States imports of bananas in recent years.

*Prices* - Both the price received by the private growers and the declared value of the banana exports are fixed by the Fruit Company. The declared value of exports varies with the conditions existing in foreign markets and the type of product shipped. The value of the same quantity of shipments will vary from year to year, and within the same year will vary as between different markets.

Stems, or bunches of bananas, are valued according to the "count." A first-class stem, or a full count, must have 9 hands, or clusters of fruit, attached to the main stem. Seconds, containing 8 hands are counted at three-fourths of one stem, and thirds containing 7 hands, are counted at one-half of one stem. When a count stem is declared at \$1.00, the seconds are valued at 75 cents and the thirds at 50 cents.

The declared unit value of exports has varied widely. It reached a peak in 1931 when very few bananas were shipped. This average per-pound price, which is purely an arbitrary value, does not give any indication of the per-count value, since it averages firsts, seconds, and thirds all together.

The price received by the grower is always lower than the declared export value. For example, in September 1932, when the declared value was set at 75 cents per count, the grower price was 60 cents a stem for firsts, 50 cents for seconds, and 40 cents for thirds.



## POSSIBILITIES FOR EXPANDED AGRICULTURAL PRODUCTION

Vast untilled acres in the fertile interior valleys and on the coastal plains offer opportunities for expanded production of many crops, especially those requiring a tropical or subtropical environment. Under the stimulus of a high protective tariff on foods and raw materials, the production of many of these items has increased. The physical factors of soil and climate are ready and waiting to be used for the production of abundant supplies, for both domestic use and export trade.

## For Domestic Use

A commission of agricultural experts has indicated the feasibility of expanded production for certain food items that Colombia now imports. These are discussed below.

## Copra

This product of the tropical coconut palm could no doubt be grown in the Atlantic coast region and inland from Barranquilla and in the Department of Magdalena. Colombia still imports about 70 percent of domestic requirements; but, with some government, or other, aid in financing the grower through the initial years, the country could become self-sufficient in copra production and should be able to export some.

## Cacao

Conditions in the arid interior valleys and in some of the arid areas of the north coast are favorable for the growth of the cacao tree. The possibilities are good for increasing production to replace the quantity now imported, or about 18 percent of domestic requirements.

## Sugar

The Cauca Valley has ideal conditions for growing sugar, although there are several other regions where increased acreage and more intensive cultivation are possible. During recent years production has increased materially, and in 1938 only 4.5 percent of total requirements was imported.

## Rice

Much good riceland is available in the interior valleys and on the great northern plain south of Barranquilla and Cartagena. Production could be increased by more extensive use of machinery. Colombia has been importing some 14 percent of domestic requirements, but it has been estimated that the equivalent of these importations could be produced on about 10,000 additional acres of land.

## For Export

Soil and climatic conditions are favorable for expanded production of the two important agricultural crops - coffee and bananas. Market possibilities at the

present time, however, are not very promising. With the loss of European markets, the Western Hemisphere, particularly the United States, is the only market for these products. Expanded exports over quantities shipped in recent years are not likely in the near future. When the world is again at peace, exports of both coffee and bananas may be expanded materially.

Other products that are now exported to a small extent or could be developed for exportation cover a wide range of crops. A group of fiber products offering very attractive opportunities for development includes Manila hemp, fique, and pita. Other export-crop possibilities include insecticidal roots, digitalis, sesame, tonka beans, and quinine. Certain sections are also favorable for rubber growing.

Even though the wide variation in temperature zones enables this country to produce almost any crop within its borders, its tropical and semitropical resources are those that complement the resources of the United States. Although coffee is by far the largest United States import from Colombia, the latter's rich resources make it a potential supplier of a much wider range of products. Perhaps more than any other Latin American country, Colombia promises to develop into a rich production plant to supply tropical products, especially for United States consumption. It would then, in turn, provide an expanding market for the products of the United States.

## THE JAPANESE SILK INDUSTRY FACES A NEW CRISIS . . . . .

By W. I. Ladejinsky\*

*The severance of trade relations between the United States and Japan put an end, among other things, to Japanese silk exports to this country. It was undoubtedly a blow to the Japanese farmers, and, at this particular juncture, to the Japanese war economy. For the time being the farmers' loss has been mitigated by a series of Government measures; though if the embargo on Japanese silk exports into the United States should continue indefinitely large numbers of Japanese farmers would lose permanently their most valuable source of cash income and Japan would again be confronted with economic distress and political unrest. There is no mitigation of the effect the stoppage of silk exports has on the country's war effort. Silk constitutes the most important single item in providing Japan with foreign exchange so urgently needed to pay for imports of strategic raw materials. The lack of this exchange is striking at a vulnerable spot in the Japanese war economy.*

On July 25, 1941, President Roosevelt issued an executive order freezing Japanese assets in the United States as of July 20. Two days later Japan countered with a similar order affecting the United States. These actions not only brought all commercial relations between the two countries under strict governmental control, but, in effect, brought the trade between the United States and Japan to a standstill.

Cessation of trade between the two countries at this juncture will hardly have any serious effect upon American agriculture. The loss sustained by American exports in the Japanese market had taken place prior to these political moves. For a number of years Japan was America's third best customer for agricultural exports, almost entirely because of the huge quantities of American cotton exported to Japan, which reached a peak of 2,400,000 bales in 1931. Japan, however, is no longer an important market for American cotton. Competition from other growths, loss of markets for Japanese cotton piece goods, and decline in consumption of textile goods in Japan - all these factors have reduced cotton exports from the United States to Japan to almost the vanishing point. Thus it is estimated that, even had there been no political difficulties, Japan's takings of American cotton in 1941 would not have exceeded 120,000 bales.

Practically the same is true of a number of other agricultural commodities, both raw and processed. The net result is that, whereas in 1936 United States agricultural exports to Japan amounted to \$95,000,000, by 1940 they had declined to \$32,000,000 and in 1941 they would probably not have exceeded \$10,000,000 even if restrictions had not been applied.

\* Agricultural Economist, Office of Foreign Agricultural Relations.



The effect of the embargo upon Japan's agriculture and, by the same token, upon Japan's economy as a whole, is a vastly more serious matter. This is due mainly to the position of silk in the Japanese export trade and in the country's agricultural economy. During the 5-year period 1930-34 Japanese silk exports to the United States accounted for 74 percent of all exports to this country; the share has declined since then, but it still averaged 61 percent during the 5-year period 1935-39. Raw silk accounted for as much as 40 percent of Japan's total exports in the early 1920's. The figure was greatly reduced in subsequent years, but during 1935-39 raw-silk exports averaged 21 percent of total exports to foreign-exchange countries. In other words, silk exports have continued to remain the principal source of foreign exchange.

The Japanese silk industry is highly vulnerable. Since normally more than half of the produce is exported, any disturbance in a consuming country has its repercussions upon Japanese silk exports and particularly silk prices. This situation is aggravated by the fact that Japanese silk exports, unlike Japanese textile exports, are not widely distributed. They are concentrated in one country, the United States. The latter has long been the principal consumer of Japanese silk, taking 86 percent of the silk exports in 1939 and an even greater proportion since the restriction of imports into Europe. It is clear, then, that even in normal times the loss of the United States market for Japanese silk would deprive Japan of its most important source of foreign exchange. This loss is particularly harmful now because of the acute shortage of foreign exchange in Japan, due to Japan's war venture in China and the loss of export trade in consequence of the present war.

Sericulture (cocoon-raising) not only provides an indispensable unit of Japan's foreign trade but has been for a long time a pillar of Japan's agrarian economic structure - so much so, in fact, that the loss of the silk market of the United States would very seriously worsen the economic welfare of millions of Japanese farmers. In 1929, 2,217,000 farm households, or nearly 40 percent of all farm families, raised cocoons. Despite the decline in recent years there were still 1,655,000, or 31 percent, in 1939. In 1940 of the total value of agricultural production cocoons accounted for 14 percent as against 42 percent for rice. Sericulture as a source of income is enhanced by the fact that raising cocoons calls for a smaller monetary outlay than many other crops. Furthermore, even in the years of depression, cocoons constituted one of the most important sources of cash income for the Japanese farmer.

In the depression of the 1930's, when silk sold for only a fraction of its former high prices, the millions of sericultural families were severely hit. The contraction of their purchasing power affected the business activity throughout the country, thereby depleting the coffers of the Government. Relief for the sericulturist has added still further to the financial difficulties of the Government. But as one writer<sup>1</sup> on the subject noted-

this was not the whole story; the worst part is that the rise or fall of the [silk] industry is not merely an economic and financial problem, but rather a social and political one; the present social unrest in Japan, indeed, is substantially attributable to the bad state of the industry, in which millions of sericulturists, small silk reelers and merchants have been almost deprived of their means of livelihood.

Such were the effects of low prices in the early 1930's. More recently the problem with which the Japanese silk industry has been confronted has been not so

<sup>1</sup> MORI, TAIKICHIRO. SILK CONTROL IN JAPAN. In Holland, W. L., ed., *Commodity Control in the Pacific Area, A Symposium on Recent Experience*, ch. 5, pp. 198-223, illus. 1935. See p. 198.

much one of low prices as one of decreasing exports, owing to the competition of other fibers. Finally, as of July 1941, the industry lost its most important outlet - the United States market. The problem, therefore, at the moment is one of adjustment to the domestic demand, a development unprecedented in the history of the industry.

## BACKGROUND

### History

Sericulture in Japan dates back to very early days, the first silkworms having been introduced from China some 2,000 years ago. But the industry did not come into its own until the latter part of the nineteenth century when Japan began to trade with the West. This came at a time when the pebrine plague throughout the silk districts of France and Italy almost ruined the silk industries of those two countries. There was thus an increased demand for Japanese silk and its consequent entrenchment in the American market. From then on, particularly during the 1920's, the sericulture industry of Japan rose by leaps and bounds, reaching its highest point of development in 1930. This rise, as it will be shown in subsequent pages, coincided with the period when wearing silk stockings in the United States became a custom of the middle and working classes.

### Physical and Economic Requirements

The cultivation of mulberry trees and the rearing of silkworms are technically possible in many parts of the world. In actual practice, however, sericulture is limited to countries with a warm, humid climate, and, above all, to countries with an abundant supply of cheap and industrious labor. Many a country is endowed with the first prerequisite, and few with both. Japan belongs with the latter group. In addition, Japan has displayed great adaptability to new techniques in raising cocoons, converting them into silk, and disposing of the silk. All these factors have enabled Japan to hold a decided advantage over other silk producers.

In Japan, mulberry trees can be cultivated everywhere, as far north as Hokkaido and as far south as Formosa. This leading subsidiary occupation of Japanese farmers, though very widespread, is not equitably distributed throughout the country. In some sections the cocoon crop is relatively small, while in others it is of paramount significance. Thus 7 of the 47 Prefectures into which Japan is divided - Nagano, Gifu, Gumma, Yamanashi, Fukushima, Yamagata, and Saitama - raise 40 percent of the cocoon crop. The acreage under mulberry in these Prefectures, in addition to that in Aichi and Ibaraki, constitutes nearly 50 percent of Japan's total mulberry acreage. For the greater part they are located in the more remote, upland parts of Japan.

In a country like Japan, where the arable land is very limited and the question of food is given primary consideration, mulberry trees are planted where rice cannot be planted, that is, in upland fields. Sometimes mulberry trees or bushes are planted in footpaths between paddy fields, on the narrow ridges of earth separating one rice field from another, and even in gardens. In this manner land is utilized that would otherwise have been wasted. The mulberry also grows on flat land the soil of which is too porous for the cultivation of irrigated rice. To sum up-

the mulberry is grown for the most part on land that is too rugged, too porous, or too dry for rice. It cannot possess such land, however, without some competition with other dry land crops, especially barley, wheat, or grapes.<sup>2</sup>

The mulberry thrives in the Japanese climate. It is sufficiently hardy to withstand the rigorous winter of the mountainous regions, and the warm period is long enough to insure more than one leaf crop a year. The plant does not require heavy precipitation for its growth, as does rice; the average rainfall in the main cocoon-growing regions is sufficient to insure a luxuriant growth of tender leaves.

#### From Worms to Silk

There are over 200 kinds of mulberry trees in Japan, but for practical purposes they are classified into early, middle, and late varieties, depending upon the period of budding. Mulberries are cultivated in Japan largely in the bush form, which produces the most leaves in the least area. The tree form is cultivated in China and Europe. In Japan the mulberry is kept down to about 4 feet. The main aim is to secure luxuriant growth and increase the amount of twigs, which are used for weaving baskets and for fuel. The plants are spaced approximately 2 feet apart in rows from 3 to 3½ feet apart, or about 4,000 plants an acre. In the more mountainous regions bushes give way to dwarfed trees, numbering from 1,600 to 2,800 an acre.

Until about the turn of the century many Japanese farmers raised their own eggs to hatch out silkworms in a very haphazard and unscientific manner. The result was that the quality of the silk was poor and its position in foreign markets was threatened. A law was therefore enacted that eggs could not be sold unless they were first pasteurized, or tested for disease. No efforts or expenditure were spared to improve their quality because, although eggs represent only 3 or 4 percent of the total production cost of cocoons, the healthy egg is the basis of quality silk.

At present all eggs are raised either by the Government, for experimental purposes, or by private plants, a great many of which are owned by the big reeling companies (filatures) and all of which are licensed by the Government and guarantee a healthy product. The variety of eggs has been reduced to a minimum. The diversity of breeds, which militates against uniformity of filaments, not to speak of quality, has been done away with, along with the complaint of American and European importers as to the lack of uniform quality in raw-silk threads.

Hatching of silkworms is a continuous process from the middle of April to late in October, because the three main cocoon crops, spring, summer, and autumn, follow closely upon each other. Thus the spring cocoons are raised from the end of April to the middle of May, the summer crop from June to July, and the autumn crop from August to September. The feeding of the silkworms, which is synonymous with raising cocoons, is the most important function of the farmers' sericultural activities. The worms are fed with very finely chopped, tender, mulberry leaves spread on flat bamboo trays. They cannot be fed with dry leaves, and for this reason the growth of the silkworms is timed to coincide with the growth of fresh mulberry leaves. Silkworms are fed five or six times a day and two or three times during the night when they are young. By the time they reach maturity, that is, are ready to spin cocoons,

<sup>2</sup> ORCHARD, JOHN E., and ORCHARD, DOROTHY JOHNSON. JAPAN'S ECONOMIC POSITION. 504 pp., illus., New York. 1930. See p. 126.



they have increased from a quarter of an inch to 3½ inches in length, and multiplied in weight 5,000 times.

The food consumed by the silkworm is partially converted into fibroin; the worm spins its cocoon by emitting this fibroin in the form of two continuous filaments varying from 600 or 800 to 1,200 yards in length, glued together by sericin. It winds these strands around itself until it is completely enclosed. The filaments forming the cocoon are silk. The silkworm completes a cocoon in from 24 to 48 hours. Four or five days later, the silkworm sheds its skin within the cocoon and turns into a chrysalis, and the chrysalis into a silk moth, which eventually bursts out of the cocoon. The male and female moths mate, the female lays eggs which hatch out silkworms, and the cycle is complete.

The quality of the cocoons depends upon their size, shape, texture, and yield. From this point of view, cocoons are divided into two main groups: First-grade cocoons (Jomayu), about 90 percent of the entire output, used in the manufacture of the highest quality products, and second-grade cocoons (Tamamayu), used only for a coarser and inferior silk. For practical purposes the Japanese farmers produce two types of cocoons, white and yellow. In 1939 the production of yellow cocoons amounted to only 6,961,724 kan (54,554,000 pounds) against 83,851,331 kan (693,216,000 pounds) of white. The yellow cocoons were used in the manufacture of broad fabrics in the United States, but the decrease in the demand for such silk caused a decrease in the yellow-cocoon output in Japan. On the other hand, the development of the hosiery industry in the United States encouraged the production of white cocoons.

#### Cost of Production and Marketing

According to an investigation made by the Imperial Agricultural Association of Japan, the cost of production of spring cocoons in 1938 was as follows:

|                 | Yen <sup>3</sup> |
|-----------------|------------------|
| Mulberry leaves | 2.42             |
| Labor           | 1.70             |
| Egg card        | 0.24             |
| Cocoonery room  | 0.20             |
| Duties          | 0.16             |
| Miscellaneous   | 0.39             |
| Total           | 5.11             |

The cost of mulberry leaves and labor accounts for approximately 80 percent of the total cost of production. Mulberry leaves alone represent about 50 percent of the cost, and 40 percent of this is spent on fertilizers. Fluctuations in the price of the latter greatly affect the cost of leaves, and by this token the production cost of cocoons. The second most important item is labor, representing 30 percent of the total cost. But it is important to remember that this is almost entirely family labor. According to investigations conducted in 1934 by the Ministry of Agriculture and Forestry, more than 83 percent of all sericultural households use only their own family labor.

Approximately 70 percent of the total cost of raw-silk production is incurred by the cost of cocoons. It is, therefore, in the interest of the large-scale

<sup>3</sup> At the average 1938 rate of exchange a yen was equal to 26.451 cents.

silk-reeling industry to secure the necessary supplies of cocoons from the huge number of competing small sericulturists at as low a price as possible. In this, with the help of the Government, they have succeeded, since in the course of the past decade or so the quality of the cocoons has been improved while the cost of cocoon production has been reduced by about one-third.

The process of sericulture (silkworm raising) ends with the marketing of the cocoons. Farmers often contract to sell all or part of their crops to the reelers who, in turn, sell or supply them with eggs. The big reelers organize associations of farmers under this type of contract, giving them expert guidance, making regular inspection of farms, and often advancing them loans to be repaid upon the sale of the crop. The average farmer, however, takes his cocoons to the nearest market, where they are generally sold at auction, the cocoons being rapidly inspected and bid for. If the market is remote, the buyer may be an independent cocoon dealer, whereas if it is near a filature the buyer may be a reeler's agent. In general about one-half of the cocoons are sold through regular cocoon markets.

#### SERICULTURE IN JAPAN'S AGRICULTURAL ECONOMY

Sericultural activities, beginning with the planting of the mulberry and ending with the shipment or the marketing of the cocoons, are carried on by millions of small farmers. The number thus engaged has fluctuated considerably in the past quarter of a century, depending upon the price of cocoons. In 1915 there were 1,670,000 sericulturists in Japan, but in consequence of the increased demand for silk and the prevailing high prices in the 1920's their number reached a peak of 2,217,000 in 1929, or 40 percent of all the agricultural families of Japan. Under the impact of the severe depression from which the silk industry suffered throughout the 1930's (excepting 1939), the number of cocoon raisers declined to 1,651,000 - a decrease of 25 percent from the peak of 1929. Despite this decline the number of sericulturists in Japan still accounts for 31 percent of all farm households.

Sericulture is not a primary occupation of Japanese farmers. In 1938, for instance, of the total of 1,618,000 families only 29,000 engaged in cocoon raising exclusively and to only 221,000 was it the chief occupation. For the vast majority sericulture is a side line, though a very important one to be sure. In 1929 the value of cocoons constituted 18.6 percent of the total value of all agricultural products; even in 1937, a year of relatively low cocoon prices, its crop value still accounted for 10.2 percent of the total, exceeding the combined value of wheat, barley, and oats. The proportion was raised to 14 percent in 1940. From the point

TABLE 1.—Families raising Cocoons in Japan, 1929-40

| YEAR  | FAMILIES<br>RAISING<br>COCOONS | TOTAL AGRI-<br>CULTURAL<br>FAMILIES | PERCENTAGE FAMILIES<br>RAISING COCOONS<br>ARE OF TOTAL | YEAR  | FAMILIES<br>RAISING<br>COCOONS | TOTAL AGRI-<br>CULTURAL<br>FAMILIES | PERCENTAGE FAMILIES<br>RAISING COCOONS<br>ARE OF TOTAL |
|-------|--------------------------------|-------------------------------------|--------------------------------------------------------|-------|--------------------------------|-------------------------------------|--------------------------------------------------------|
|       | : Number :                     | Number :                            | Percent                                                |       | : Number :                     | Number :                            | Percent                                                |
| 1929: | 2,217,000:                     | 5,576,000 :                         | 39.8                                                   | 1935: | 1,895,000:                     | 5,611,000 :                         | 33.8                                                   |
| 1930: | 2,216,000:                     | 5,600,000 :                         | 39.6                                                   | 1936: | 1,857,000:                     | 5,597,000 :                         | 33.2                                                   |
| 1931: | 2,120,000:                     | 5,634,000 :                         | 37.6                                                   | 1937: | 1,819,000:                     | 5,575,000 :                         | 32.6                                                   |
| 1932: | 2,065,000:                     | 5,643,000 :                         | 36.6                                                   | 1938: | 1,696,000:                     | 5,441,000 :                         | 31.2                                                   |
| 1933: | 2,092,000:                     | 5,622,000 :                         | 37.2                                                   | 1939: | 1,651,000:                     | - :                                 | -                                                      |
| 1934: | 1,995,000:                     | 5,617,000 :                         | 35.5                                                   | 1940: | 1,648,000:                     | - :                                 | -                                                      |
| :     | :                              | :                                   | :                                                      | :     | :                              | :                                   | :                                                      |

Compiled from official sources.

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of view of marketability and a source of cash income, cocoons occupy a premier position. The entire crop enters the market and it accounts for approximately one-fourth of the value of all agricultural products sold.

The disappearance of some 521,000 sericulturists within the period 1929-38 does not mean that the country has lost that many farmers, for during the period under consideration the total number of agricultural families in Japan decreased by only 135,000, or 2.5 percent. It does mean, however, that this many farmers were forced to give up one of the most lucrative subsidiary industries as far as cash income is concerned and to rely mainly upon the cultivation of food crops. In the principal sericultural Prefectures many a farmer cannot make a living from producing domestic agricultural crops alone.

The decline in the number of sericulturists is reflected in the reduced acreage under mulberry. Between 1915 and 1930 the area increased from 1,092,000 to 1,718,000 acres. This represented 12.1 percent of the total arable land of Japan, or 26.5 percent of the arable upland acreage. The greatest single increase occurred in 1930 (213,000 acres more than in 1929) due to the prevailing high prices the preceding year. After 1930, however, the mulberry acreage declined steadily, and by 1939 had decreased 25.3 percent. This downward trend was contrary to changes taking place in the total arable area of Japan. With the exception of 1938 and 1939, when a decline was registered, the country's arable land during the period 1929-39 increased by 3.1 percent.

TABLE 2.- Area of mulberry farms in relation to total arable land in Japan, 1929-40

YEAR	TOTAL ARABLE LAND	TOTAL MULBERRY FARMS	PERCENTAGE MULBERRY FARMS ARE OF TOTAL	YEAR	TOTAL ARABLE LAND	TOTAL MULBERRY FARMS	PERCENTAGE MULBERRY FARMS ARE OF TOTAL
	: 1,000 acres:	: 1,000 acres:	Percent		: 1,000 acres:	: 1,000 acres:	Percent
1929 :	14,187 :	1,505 :	10.6	1935 :	14,576 :	1,401 :	9.6
1930 :	14,232 :	1,718 :	12.1	1936 :	14,641 :	1,362 :	9.3
1931 :	14,324 :	1,643 :	11.5	1937 :	14,671 :	1,350 :	9.2
1932 :	14,415 :	1,570 :	10.9	1938 :	14,623 :	1,322 :	9.0
1933 :	14,503 :	1,540 :	10.6	1939 :	14,624 :	1,283 :	8.8
1934 :	14,524 :	1,499 :	10.3	1940 :	- :	1,308 :	-
:	:	:	:	:	:	:	:

Compiled from official sources.

Considering the unprofitableness of raising cocoons during the years 1930-38, the acreage reduction should have been even greater. The increasing prices of other agricultural products after 1931 should have led the farmers to even more drastic adjustments in their mulberry acreage. A number of factors militated against such adjustment, factors that characterize the economy of sericulture in Japan. For example-

farmers were reluctant to give up the fixed investment which their mulberry trees represented, and continued to hope for a return to the price level as profitable as that which prevailed prior to 1930. Many mulberry trees were planted in soil which was not adapted to the production of more profitable commodities. Finally, cocoon production, requiring extensive use of hand labor, offered the farmer a chance to utilize the surplus labor of his family members.*** Cocoons secured a cash payment on delivery and this represented in part a return for labor which could not have been invested elsewhere. This factor tended to outweigh considerations of cost of production, the calculation of which included provision for labor costs.⁴

The foregoing helps to explain why the Japanese Government had to offer the farmers large subsidies in order to effect a curtailment in the output of cocoons

⁴ WHITE, IVAN B. THE STATUS OF JAPAN'S SILK INDUSTRY. Report of American vice consul at Yokohama, 1940. [Typewritten]

and adjustments in the mulberry acreage. The abandonment of approximately 282,000 acres of a total of 396,000 acres (1930-38) was due to Government efforts and a subsidy of 12 million yen. Inferior mulberry trees covering 130,000 acres were replaced with superior trees, at an expenditure to the Government of 6 million yen. Finally, a Government subsidy of 2.5 million yen was devoted to the cultivation of other crops alongside mulberry trees on an area of 93,000 acres.

The program of reducing mulberry acreage was abandoned in 1938. Instead, the Government launched a program of expanding it and of raising the output of cocoons. The reversal of policy was attributed to the fact that the sharp decline in the 1938 cocoon production coincided with an increased domestic demand for silk products. The latter were to serve, wherever possible, as substitutes for textiles and other goods, which were expected to fall short of need because of import restrictions. The policy of expanding mulberry acreage was again reversed in 1941, when besides the great reduction in the exports of raw silk in 1939 and 1940 trade relations between the United States and Japan were virtually severed.

The output of cocoons prior to 1931 rose uninterruptedly, but in subsequent years the trend was mainly in the opposite direction. In 1930 the farmers produced a record cocoon crop of 876 million pounds, whereas in 1938 the output of 620 million pounds was the lowest since 1925 and 25.7 percent below that of 1929. On occasions weather conditions affect the output of cocoons adversely, but normally fluctuations in the cocoon crop may be attributed primarily to changes in cocoon prices and their relation to cost of production. Prices of products purchased by the sericulturists in relation to cocoon prices also enter into the picture.

Table 3 shows that during the period 1929-39 prices were below the cost of production in 1930-32 and 1934 and that in 1938 they were practically the same as the cost. The farmers whose chief source of income was sericulture were particularly hard hit, as were to a lesser extent the great majority of sericulturists with whom cocoon raising was a subsidiary occupation. Their income from cocoons was curtailed more sharply and rapidly at the very inception of the depression than was their return from the cultivation of other products. Prices from Japanese farm commodities began to rise steadily after the depreciation of the yen in 1931, and by 1938 prices for leading products, with the exception of cocoons, were above those of 1929, as indicated by the following data:

	1929 ⁵	1931 ⁵	1938 ⁵
Cocoons (average price in yen per kan) ⁶	6.42	2.84	4.60
Rice (average price in yen per koku) ⁷	29.24	18.60	34.03
Wheat (average price in yen per 100 kin) ⁸	7.41	4.03	10.17

The value of the cocoon crop in any 1 year after 1929 and prior to 1939 sums up, as it were, the plight of the sericulturists. The violence of the fluctuations is also notable - 655 million yen in 1929, 304 million in 1930; 500 million in 1933, 204 million in 1934. The recovery in the following 4 years fell far short of raising the value to predepression levels. In 1938 the total value of the cocoon crop was 47.2 percent less than in 1929.

⁵ The value of the yen in United States cents was for 1929, 46.0997; for 1931, 46.8509; and for 1938, 28.451.

⁶ 1 kan equals 8.2672 pounds.

⁷ 1 koku of brown rice equals 322.4 pounds.

⁸ 1 kin equals 1.323 pounds.

TABLE 3.—Production, cost of production, price, and total value of cocoon crop in Japan, 1929-40

YEAR	QUANTITY OF COCOONS PRODUCED		ESTIMATED COST OF PRODUCTION		AVERAGE PRICE		VALUE OF COCOON CROP	
			PER KAN	PER POUND	PER KAN	PER POUND		
	: 1,000	: 1,000	: Yen	: Cents	: Yen	: Cents	: Million	: Million
	: kan	: pounds					: yen	: dollars
1929 :	102,093	844,023	6.12	34	6.42	35.79	655	302
1930 :	106,464	880,159	5.02	30	2.86	17.08	304	150
1931 :	97,072	802,514	3.62	21	2.84	16.78	276	135
1932 :	89,550	740,328	3.49	12	3.31	11.25	296	83
1933 :	101,164	836,343	3.79	12	4.94	15.32	500	128
1934 :	87,140	720,404	3.65	13	2.34	8.41	204	61
1935 :	82,066	678,456	3.75	13	4.28	14.86	351	101
1936 :	82,892	685,285	3.87	14	4.66	16.35	386	112
1937 :	85,972	710,748	3.91	14	4.88	16.99	420	121
1938 :	75,256	622,156	4.55	16	4.60	15.83	346	98
1939 :	90,813	750,769	6.01	19	9.72	30.52	883	229
1940 :	87,546	723,760	-	-	9.85	27.92	862	202
:	:	:	:	:	:	:	:	:

Compiled from official sources.

The situation was completely changed in 1939. The short cocoon crop of 1938 and a number of other factors relating more directly to the anticipated increased demand for silk caused cocoon prices to advance sharply. The average 1939 price was 9.72 yen per kan as against 4.60 the year previous, while the total value of the crop was 155 percent above that of 1938 and 35 percent above that of 1929. This sharp rise wiped out the disparity between cocoons and Japan's general commodity price level. As regards the change in the price of cocoons in relation to other agricultural commodities, it may be observed that the 1939 price of the former was at a higher level, compared with 1929, than rice, but somewhat lower than wheat.

SILK PRODUCTION AND DOMESTIC CONSUMPTION

The ups and downs of the Japanese sericulturists noted in the preceding pages is something over which they have no control. Their fortunes are entirely dependent upon the reelers (silk manufacturers) who process the cocoons into raw silk. But the fortunes of the reelers, in turn, are governed by their ability to dispose of the output at remunerative prices in the American market. In order, therefore, to assess the present status of sericulture in Japan it is necessary to observe the changes in the production of silk, its distribution and prices, as well as the Government policy concerning the industry in recent years.

TABLE 4.—Production and consumption of raw silk in Japan, 1925-40

YEAR	PRODUCTION		CONSUMPTION		YEAR	PRODUCTION		CONSUMPTION	
			QUANTITY	SHARE OF PRODUCTION				QUANTITY	SHARE OF PRODUCTION
	: Million	: Million		Percent		: Million	: Million		Percent
	: pounds	: pounds				: pounds	: pounds		
1925 :	68	-		-	1933 :	94	29		30.8
1926 :	76	17		22.3	1934 :	100	33		33.0
1927 :	81	15		18.5	1935 :	96	-		-
1928 :	87	19		22.0	1936 :	93	-		-
1929 :	93	18		19.3	1937 :	92	-		-
1930 :	94	22		23.4	1938 :	95	42		44.2
1931 :	96	23		24.0	1939 :	93	52		55.9
1932 :	95	28		29.4	1940 :	95	47		49.5
:	:	:			:	:	:		

Compiled from official sources.

Japan is the world's largest silk producer, accounting for approximately three-fourths of the total in the past decade. The country's silk output has been steadily growing since the commencement of trade with the West. During the pre-war period of 1909-13 Japan produced an average of 28 million pounds a year. This figure rose to 54 million pounds during 1920-24, finally reaching an output of 94 million pounds in 1930, the first year of the depression. It is a characteristic feature of Japanese silk production that in subsequent years output remained relatively stable, notwithstanding the wide fluctuations in raw-silk prices. The annual production during 1929-40 was 94.6 million pounds, as against the record output of 100 million in 1934.

The reason for this uniformity of silk output is the growing domestic consumption of raw silk. Until 1930 the domestic market absorbed about 17 million pounds of silk annually, or 20 percent of the country's output (1926-29). Since then, however, domestic absorption of silk has risen steadily, and during the years 1938-40 it averaged 47 million pounds annually, or 49.8 percent of the yearly output. Prior to 1939 raw-silk exports were always considerably larger than domestic consumption, but in 1939 the latter exceeded Japanese silk exports and for the first time in the present century Japanese silk consumption exceeded that in the United States. The rise in domestic consumption may be traced largely to the shortage of raw cotton and wool and in consequence of that an increased use of silk for mixing with those imported materials.

Late in 1937 the Japanese Government decreed a restriction on the use of wool and cotton for domestic consumption, with a view toward conserving foreign exchange for more vital needs, created by Japan's war against China. The use of cotton and wool has been limited to the production of (1) export goods, (2) military or industrial goods, and (3) small quantities of material for special purposes, such as hospital materials and the like. Because of this restriction, raw-cotton and raw-wool imports declined from those of 1937 by 26.7 percent in 1938 and 59 percent in 1939.

At the same time the Government inaugurated a campaign of encouraging the mixing of silk with other fibers, as well as the production of low-grade silk textiles. At first the policy of expanding domestic consumption of silk was not embodied in any law or governmental decree; later on, however, declining exports, heavy supplies of silk on hand, and shortage of clothing induced the Government (October 1, 1940) to issue an order prohibiting the spinning or wearing of cotton, wool, rayon, and staple fiber unless mixed with silk on a basis of a maximum of 30 percent by weight and a minimum of 20 percent. Such a measure was expected to raise consumption of silk in Japan by more than 25 percent, or the total volume of consumption to approximately 66 million pounds. Since the increased domestic consumption is to be accompanied by drastic reduction in raw-silk production, it would seem that the Japanese Government anticipates a further decline in silk exports rather than a recovery from the present levels and is, in general, attempting to adjust the silk industry, at least for the time being, to the domestic rather than the foreign market.

JAPANESE SILK EXPORTS

The Japanese silk industry was developed in response to foreign, rather than domestic, demand. In the years before the depression at least four-fifths of the output was exported. The peak was reached in 1929, when Japan exported 99 million pounds


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of silk. Exports have declined since then; but, in view of the severity of the depression, the falling off in the volume of exports prior to 1939 was not pronounced. The average annual exports during 1930-38 was 67 million pounds, or 9 percent less than the maximum and 6 percent above the minimum exported volume in any year of this period. Furthermore, while the average of 67 million pounds was 13 percent below the peak of 1929, it was 11 percent above the annual average of 1924-28. The relative stability of exports maintained from 1930 through 1938 was completely upset in 1939 and particularly in 1940, when the exported volume was the smallest since 1924.

TABLE 5.—Japanese exports of raw silk, 1929-40

| YEAR                | QUANTITY           | VALUE         |                   | PERCENTAGE OF QUANTITY TO— |           |           |           |
|---------------------|--------------------|---------------|-------------------|----------------------------|-----------|-----------|-----------|
|                     |                    |               |                   | UNITED STATES              | ENGLAND   | FRANCE    | OTHERS    |
|                     | : Million pounds : | Million yen : | Million dollars : | Percent :                  | Percent : | Percent : | Percent : |
| 1929 :              | 77 :               | 781 :         | 360 :             | 96.7 :                     | 0.5 :     | 1.7 :     | 1.1 :     |
| 1930 :              | 63 :               | 417 :         | 206 :             | 95.7 :                     | 0.7 :     | 1.9 :     | 1.7 :     |
| 1931 :              | 74 :               | 355 :         | 173 :             | 96.1 :                     | 1.3 :     | 1.4 :     | 1.2 :     |
| 1932 :              | 73 :               | 382 :         | 107 :             | 94.2 :                     | 2.4 :     | 1.9 :     | 1.5 :     |
| 1933 :              | 63 :               | 391 :         | 100 :             | 91.0 :                     | 3.7 :     | 3.9 :     | 1.4 :     |
| 1934 :              | 67 :               | 287 :         | 83 :              | 83.5 :                     | 5.1 :     | 7.0 :     | 4.4 :     |
| 1935 :              | 73 :               | 387 :         | 111 :             | 84.3 :                     | 5.1 :     | 6.3 :     | 4.3 :     |
| 1936 :              | 67 :               | 393 :         | 114 :             | 85.0 :                     | 5.7 :     | 5.5 :     | 3.8 :     |
| 1937 :              | 63 :               | 407 :         | 117 :             | 80.3 :                     | 7.3 :     | 6.4 :     | 6.0 :     |
| 1938 :              | 63 :               | 364 :         | 104 :             | 82.4 :                     | 7.0 :     | 6.6 :     | 4.0 :     |
| 1939 :              | 51 :               | 507 :         | 132 :             | 85.9 :                     | 7.1 :     | 3.6 :     | 3.4 :     |
| 1940 : <sup>1</sup> | 38 :               | - :           | - :               | - :                        | - :       | - :       | - :       |

<sup>1</sup> Preliminary.

Annual and Monthly Return of the Foreign Trade of Japan.

### United States Share of Exports

The distribution of Japanese raw-silk exports is noteworthy because it indicates the basic weakness of the Japanese silk industry. By far the greatest volume of Japanese silk exports goes to the United States. Before the World War of 1914-18 silk was a luxury even in the United States. But in the post-war boom the United States became the first country in which it could really be said that silk was taken for granted. What was once a luxury became a necessity. In 1929, at the height of the boom, Japan shipped to the United States 96.7 percent of all its silk exports. In other words, the primary function of the Japanese silk industry was to serve the needs of the prosperous, silk-consuming people of the United States. Japanese silk exports until 1933 were practically synonymous with silk exports to the United States.

Exports have decreased since the peak of 1929 to about 83 percent of the total (1935-39). Conversely, shipments to Europe have risen, especially since 1932. A large part of this increased use of Japanese silk occurred in Great Britain, whose hosiery-manufacturing industry has made rapid progress. In the face of a depreciated yen currency silk producers of Italy and Spain have found it hard to compete with Japanese silk. Chinese raw silk, once a close rival of Japanese, was for the time being (1932-38) almost eliminated as an export product, subjected as it was to the adverse effects of a cheap yen, sharp fluctuations of the silver exchange, and a declining sericultural technique. With the outbreak of the European war the European markets were cut off, and the United States was again practically the sole outlet for Japan's silk exports.

This outlet, however, has been shrinking, as indicated by total United States silk imports as well as imports from Japan in the past 15 years. Total imports

TABLE 6.—Imports into the United States of raw silk by countries of origin 1926-40

| YEAR  | COUNTRY OF ORIGIN |                 |                 |                 |                 | JAPANESE<br>SHARE OF<br>TOTAL IMPORTS |
|-------|-------------------|-----------------|-----------------|-----------------|-----------------|---------------------------------------|
|       | JAPAN             | CHINA           | EUROPE          | OTHER COUNTRIES | TOTAL           |                                       |
|       | : Million pounds: | Million pounds: | Million pounds: | Million pounds: | Million pounds: | Percent                               |
| 1926: | 53.8              | : 10.2          | : 1.4           | : 1.0           | : 66.4          | : 81.0                                |
| 1927: | 61.8              | : 10.8          | : .6            | : .8            | : 74.0          | : 83.5                                |
| 1928: | 64.1              | : 9.5           | : .8            | : 1.1           | : 75.5          | : 84.9                                |
| 1929: | 69.8              | : 14.5          | : 2.4           | : .4            | : 87.1          | : 80.1                                |
| 1930: | 59.9              | : 10.0          | : 3.8           | : (1)           | : 73.7          | : 81.3                                |
| 1931: | 69.5              | : 9.8           | : 4.5           | : .1            | : 83.9          | : 82.8                                |
| 1932: | 69.1              | : 2.5           | : 2.4           | : .1            | : 74.1          | : 93.3                                |
| 1933: | 60.2              | : 3.8           | : 3.2           | : (1)           | : 67.2          | : 89.6                                |
| 1934: | 55.0              | : 1.1           | : .3            | : (1)           | : 56.4          | : 97.5                                |
| 1935: | 63.8              | : 3.5           | : .4            | : (1)           | : 67.7          | : 94.2                                |
| 1936: | 55.7              | : 2.5           | : 2.2           | : (1)           | : 60.4          | : 92.2                                |
| 1937: | 53.9              | : 2.7           | : 1.2           | : 0             | : 57.8          | : 93.3                                |
| 1938: | 51.3              | : 1.6           | : 2.3           | : 0             | : 55.2          | : 92.9                                |
| 1939: | 44.6              | : 5.9           | : 1.1           | : 0             | : 51.6          | : 86.4                                |
| 1940: | 36.4              | : 6.9           | : 1.6           | : 0             | : 44.9          | : 81.1                                |
| :     | :                 | :               | :               | :               | :               | :                                     |

<sup>1</sup> Less than 50,000.

Compiled from Foreign Commerce and Navigation of the United States and official records, Bureau of Foreign and Domestic Commerce.

declined from an average of 75 million pounds in 1926-30 to 70 million pounds in the following 5-year period and finally to 54 million pounds during 1936-40, or a decline of 28 percent over the whole period. United States silk imports from Japan during the same period amounted to 60, 64, and 48 million pounds, respectively, or a decline of 20 percent. The decrease has been continuous since 1935, in 1940 being 39.4 percent smaller than the average of 1926-30 and 52.7 percent below the average of 1931-35. Total United States imports in the same year were 40.2 and 35.9 percent, respectively, less than the average for the periods just mentioned.

### Value of Exports

In the 1920's the export value of Japanese raw silk played such an important part that the country "paid its way internationally with raw silk." In 1929 the value of Japanese silk shipped abroad represented 36.4 percent of all exports. Today this no longer holds true. While the volume of Japanese silk exports held up quite well during the 1930's (with the exception of 1939), the decline in value was disastrous.

The United States continued to consume silk, but only on the condition that it could get it cheap. In 1929, when the value of the United States imports of Japanese raw silk amounted to 356 million dollars the quantity was nearly 70 million pounds, and in 1931 when the value of imports was down to 163 million dollars, the volume was practically the same. Even the depreciation of the yen in December 1931 failed to bolster up the price of silk for any considerable length of time. The price of silk during the first few months of 1932 was almost double the price of 1931, but when, as a result of this increase, the demand for silk in the United States fell off, the price declined sharply in terms of dollars to almost the same price in yen as before Japan went off the gold standard.

This was due to the fact that the elasticity of the demand for silk, other textile substitutes being available, is high above a certain price level. The elasticity of demand is particularly high in a period of severe depression. The Japanese could sell in the United States something in the neighborhood of a predepression

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volume of silk only on the basis of very low prices. So the silk price declined from \$4.93 a pound in 1929 to \$1.30 in 1934, or nearly 74 percent. The total value of exports within the same period declined by 781 million yen (\$360,000,000) to 287 million yen (\$83,000,000), or to the lowest level reached since 1917. The net result was impoverished cocoon raisers, bankrupt reelers, silk traders, and exporters, a serious exchange problem for the Japanese Government, and general political unrest.

The situation in Japan improved somewhat after 1934, but prices did not experience the recovery characteristic of Japanese industry and trade generally. By the middle of 1936 wholesale prices in Japan, with the exception of those of silk, regained their 1929 levels; silk prices were still 41.4 percent below those of 1929. No substantial changes occurred in 1937 and 1938. Adequate supplies of silk, availability of cotton and wool textile goods - although not in abundance - recession in the United States, and the great inroad of rayon caused by repeated reductions in rayon prices, all prevented the rise of silk prices.

In 1939, however, silk prices staged a very sharp and rapid rise, as illustrated by the following average monthly quotations:

	<i>Yen per bale</i>
1938 - December	820
1939 - July	1,237
August	1,243
September	1,576
October	1,748
November	1,852
December	2,137
1940 - January	2,230

From December 1938 to December 1939 and January 1940, prices advanced 161 and 194 percent, respectively. The rise in prices between December 1938 and July 1939 "was of a correctional nature and justified by the statistical position of silk,"⁹ involving a shortage of cocoon production, augmented domestic consumption of silk, and improvement in economic conditions in the United States. The basis of the spectacular advance that began upon the outbreak of the war was of a different nature. To begin with, there was the further depreciation of the yen in terms of the dollar; the accumulation of large stocks by Japanese weavers who expected further restrictions in the use of imported fibers; speculative buying; and, finally and most important, "the belief of Japanese silk traders that there would be a 'war boom' in the United States, and that silk prices would skyrocket as they did in the closing years of the World War."⁹

The silk industry as a whole benefited during the boom period of rising prices, but the boom was short-lived. The huge increase in price served to curtail silk exports very markedly, even though consumers' incomes in the United States were rising. In other words, the anticipated American demand for silk, the main cause of the frenzied speculative activities, not only failed to materialize but declined so significantly that 1940 imports (36.4 million pounds) were the smallest since 1921. Lacking American support, prices tobogganed back to 1,360 yen per bale within the short period of 6 months.

⁹ See reference cited in footnote 4.

Competition of Silk With Other Fibers

Judging by the causes underlying this downward movement in exports of silk to the United States, it would seem that it is not a temporary phenomenon, and herein lies the seriousness of the position of the Japanese silk industry. Silk has been losing ground through the competition with rayon for a number of years now, and in the past year from competition with nylon. Because of improved quality and reduced prices of rayon, the latter has been replacing silk in woven goods very rapidly; in 1939 silk comprised only 10 percent of the combined consumption of both fibers, as against 40 percent in 1929. The displacement of silk by rayon has occurred chiefly in woven goods. Thus from 1929 to 1939 the consumption of silk in that field has declined from 60 million pounds to only 6 million pounds in 1939, whereas that of silk in hosiery manufacture has increased from approximately 20 to 38 million pounds. The gain in the latter field was not sufficient to offset the loss in the former place, with the result that between the same period of time total silk consumption in the United States declined from about 81 million pounds to 36 million, as against an increase in rayon from 121 million pounds to 360 million.

It may be mentioned here that even before rayon came to affect silk consumption so adversely, Japan's silk manufacturers went into the rayon business themselves. In a relatively short time Japan became, next to the United States, the largest rayon producer. This undoubtedly has helped the silk manufacturers, particularly the big ones, to make up for the losses they have sustained in silk manufacturing. In no way, however, did it alleviate the sufferings of a large segment of the population, which in the predepression days contributed so greatly to the economic development of Japan for so little a return.

By 1940 the hosiery industry had become silk's main outlet, accounting for 90 percent of all the silk consumed in the United States. This volume of silk was primarily used in women's full-fashioned hosiery. But even this stronghold of raw silk has not remained unassailed. The immediate effect of high silk prices in 1939 in this field was the substitution of rayon and other materials in tops and bottoms of silk stockings. But the first real threat to the advancing production of full-fashioned hosiery came in 1940 with the introduction of a new synthetic fiber - nylon.

Nylon is now beginning to compete with silk for a position in the hosiery industry. Whether nylon will displace silk in the manufacture of hosiery to the same extent as rayon has displaced silk in the textile field will depend upon the consumers' acceptance of the quality and "feel" of nylon; upon the rapidity with which the fiber is perfected; and, of course, upon the price relationship between silk and nylon. In 1940 nylon had little effect on the utilization of silk in the hosiery industry, but it is estimated that in the second quarter of 1941 production was at a rate of over 100 million pairs a year. This is equivalent to 20 percent of the total 1940 output of all full-fashioned hosiery.

The Japanese silk industry is aware of the threat and does not underestimate the competitive strength of nylon. The following extract from an article by an important silk official is an expression of that attitude:¹⁰

¹⁰ Quoted in a consular report by Jules L. Goetzmann, American vice consul at Yokohama, from an article in the Japan Advertiser, March 3, 1940, by Eitaro Okamoto, vice president of the Central Raw Silk Society of Japan.

One reason why I urge earnestly the taking of drastic measures now for safeguarding the future of the silk industry of this country is that it is quite doubtful whether Japan can continue to export silk in large quantities without hitch in the future as it has done in the past. It is also doubtful whether or not silk will be used as widely as now for clothing in Japan itself.

Socks and stockings made of Nylon were placed on the market in the United States in October last year. There is little difference in the appearance of hosiery made of Nylon and hosiery made of silk, and in durability Nylon hosiery surpasses silk hosiery. Though it is obvious that Nylon is inferior to silk in some ways, the present defects of Nylon eventually will be removed as a result of scientific research.

It cannot be denied, therefore, that Nylon sooner or later will become a menace to Japan's silk industry. If the situation is not remedied, the export position of Japanese silk will grow more and more discouraging.

Silk Exports as a Source of Foreign Exchange

A consideration of Japanese silk exports and their place in the Japanese economy would be incomplete without touching upon silk as a source of foreign exchange. Japan lacks, and must therefore import, such essential commodities as iron ore and scrap iron, cotton, wool, oil, rubber, and machine tools and other industrial equipment and pay for them by its exports. Japan generally has an adverse balance of merchandise trade and service items combined. In order to reduce this adverse balance, or even to bring about a favorable one, Japan has been endeavoring to receive for its exports a maximum net amount of foreign exchange. Silk is the top-ranking item in this respect in Japan's export trade.

Between 1929 and 1939 raw-silk exports declined from 36.4 to 14.2 percent of the value of Japanese exports. The causes underlying this downward trend have already been discussed; what is worth pointing out here is that the latter figure does not reflect the real position of raw-silk exports as a source of foreign exchange. This can be indicated by placing the value of silk exports against the value of all Japanese exports to foreign-currency countries. When this is done, 1939 raw-silk exports represent 27.7 percent, and together with other silk products, 30 percent of the value of all exports. Although cotton-goods exports ran a close second to silk (29.3 percent), more than twice as much net foreign exchange was derived from silk (549 million yen as against an estimated 249 million yen). The purchase of raw cotton consumed in the manufacture of the cotton goods used up 54 percent of the exchange obtained from the sale of the cotton goods. On the other hand, the main raw material of silk - cocoons - is entirely domestically produced; the proceeds from the silk sales are therefore so much net foreign exchange gained. This is an outstanding feature of raw silk and is in direct contrast to nearly all other textile fibers manufactured in Japan, the raw materials of which must be wholly or partly imported.

On the whole, it was estimated that in 1939 silk exports provided approximately 40 percent of the net foreign exchange acquired by Japan through its export merchandise trade. The importance of silk in this respect cannot be overestimated. During the years 1937-39 Japan's adverse balance of merchandise trade with foreign-currency countries amounted to 1,853 million yen; the balance was settled mainly through shipments of gold, a procedure that greatly depleted Japan's very limited gold reserves. The adverse balance would have been greater, and so would the strain and depletion of the gold reserves, but for the relatively higher proportion of foreign exchange secured in payment for silk exports.

PRESENT CRISIS IN THE SILK INDUSTRY

Wide fluctuation in the price of raw silk has characterized the silk industry of Japan for many years past. And at the present time, as on previous occasions, the Japanese Government has had to step in to prescribe for the industry. From 1914 on, the Japanese raw-silk interests have been unable to solve the recurrent crises in the industry alone. Hence the repeated attempts during the past 25 years to maintain the price of silk by means of Government loans and subsidies, Government purchases of surplus silk, and restrictions of silk sales and silk output sponsored by the Government. In the main the measures have failed of their aim, and in the process of bolstering up prices the Government has lost more than 100 million yen. In the long run, the success or failure of the Government policies until very recently depended almost entirely upon economic conditions in the United States.

The crisis in the silk industry in 1940 was of a more serious nature than any of the previous ones, for competition from other fibers was never as serious and the need for foreign exchange never as urgent. To be sure, prices in 1940 even after the decline were higher than in the worst depression years, but they were also sufficiently high to impede silk exports to the United States. This resulted in still greater loss of ground to rayon. At about this time also there arose the threat of nylon for a place in the one field where the position of raw silk seemed very strong, if not impregnable. Furthermore, the problem of foreign exchange was assuming ever-increasing importance as the war against China and the militarization of Japan continued unabated. Japan was therefore confronted with the problem of stabilizing prices at such a level as to regain some of the lost market and at the same time secure a maximum return of foreign exchange. In the attempt to accomplish these aims, the Japanese Government enacted a number of control measures beginning in December 1939 and culminating in the far-reaching and all-inclusive Raw Silk Industry Control Law enacted on March 12, 1941.

The rapid rise of silk prices in the winter of 1939 caused the Government to announce plans for the control of raw-silk prices and silk distribution. One of the measures dealt with the establishment of a reserve fund; its purpose was to discourage trading at prices above 1,700 yen per bale (later reduced to 1,400) by requiring the deposit of excess receipts in an official fund. The levy was on a graduated scale and it increased in percentage as the raw-silk prices rose. It was expected to make speculation, in anticipation of higher prices, less profitable than it was in the latter part of 1939. Within 6 weeks, however, the severe decline of prices on the silk market removed the need for the reserve-fund system.

On January 9, 1940, the Government enacted regulations providing for governmental control of the distribution of silk within Japan. Each silk manufacturer was assigned a distribution quota, which determined not only the volume of silk produced but also the share of the output exported and that consumed domestically. It was expected that through the quota system, if properly operated, more abundant supplies could be made available for export for the purpose of obtaining foreign exchange. The measure was obviously promulgated in the expectation of large exports of raw silk to the United States. Such hopes, however, failed to materialize, as only an exceptionally small volume of silk was exported to the United States.


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With the decline in price early in the spring of 1940, the activities of the Government centered on preventing their fall below 1,350 yen per bale. It embarked on a much-tried and none-too-successful program of purchasing silk and storing it for the time being. The plan was to purchase 150,000 bales, an operation that was to have supported the silk market until American demand for silk improved. Meanwhile, in exact opposition to the course pursued a few months earlier, a determined effort was being made to increase domestic consumption by forcing weavers of cotton, wool, and rayon textiles to increase the percentage of silk fiber in their fabrics. It was believed that "by these means the supply of silk for domestic consumption will increase by between 30 and 40 percent."<sup>11</sup>

The above-mentioned measures were expedients devised chiefly to take care of problems arising from current developments. They were not effective, chiefly because the sharp decline in the demand for silk in the United States was not of a temporary nature, and the prospects for improvement were poor indeed. Previously there had always been a reasonable assurance that a slump in silk prices would be corrected by a rising curve of economic activity in the United States. The years 1939 and 1940 demonstrated, however, that, owing to the competition of other fibers, improved economic conditions in the United States do not necessarily go hand-in-hand with larger takings of silk even at reasonable prices.

This all-important fact was not lost on the Japanese silk industry or the Government. Writing on the probable extent and consequence of the competition of synthetic fibers and the possible remedies,<sup>12</sup> the vice president of the Central Raw Silk Society of Japan stated that-

improvement of the quality, the improvement of the production method and the increasing ways in which silk is used, are the three prerequisites for the future development of Japan's silk industry.

Such measures are in the realm of scientific research, which the Japanese have never neglected as a means of strengthening the silk industry. But that alone is not sufficient under the changed circumstances. The same official wrote, therefore, that,

in my opinion, it would be best to establish a strong controlling agency, including sericulturists, reelers, weavers and distributors. Should this plan materialize, the price naturally would be stabilized, and Japanese silk would be able to compete with nylon in the future.

The Government, too, evidently was of the opinion that the unified control of all the main branches of the industry here suggested would be beneficial, for on March 12, 1941, the entire silk industry - from silkworm eggs to the distribution of raw silk - was placed under complete Government control through the promulgation of the Raw Silk Industry Control Law.

#### THE RAW SILK INDUSTRY CONTROL LAW

This law aims to correct the existing maladjustment in the silk industry, to foster a large export trade in silk, and in general to place the industry on a sound basis. Thus the law provided for the establishment of the Japan Raw Silk Control Company, a semiprivate organization operating under Government supervision. The

<sup>11</sup> Quoted in a consular report by Jules L. Goetzmann from the *Tokyo Nichi Nichi*, April 7, 1940.

<sup>12</sup> See reference cited in footnote 10.

company has exclusive control over both production and distribution of raw silk. Specifically, the main functions of the Japan Raw Silk Company are (1) exclusive purchasing and distribution of silkworm eggs and cocoons; (2) control over sales of raw silk; (3) adjustment of the supply of silkworm eggs and silk-reeling facilities to market conditions; (4) stabilization of raw-silk and cocoon prices; (5) establishment of reserve funds for the maintenance of an equilibrium between cocoon and raw-silk prices; (6) absorption of cocoon markets and their functions; (7) investigation and study of the raw-silk industry; and, finally, (8) other activities that might arise in the course of the company's widespread operations. The work of the company is backed by special Government decrees, and failure to comply with the company's decisions on the part of anyone engaged in dealing with it is punishable by law.

The company determines the purchasing and selling prices of silkworm eggs, cocoons, and raw silk (subject to approval by the Minister of Agriculture and Forestry), taking into consideration the total demand for raw silk, the prices of all commodities, and other pertinent economic conditions that affect the cost of production of silkworm eggs, cocoons, and raw silk. With regard to raw silk, a double price system has been adopted. Official prices will be fixed for raw silk for domestic consumption, while the policy of standard maximum and minimum prices as originally provided in the Raw Silk Stabilization Law of 1937 will continue in the case of raw silk that is to be exported.

The company has no direct control over the silk exchanges or over raw-silk exports. The control company does not engage in exporting silk; that function remains with the exporters who purchase the silk from the company. On the other hand, raw silk for domestic consumption is sold directly by the company. The Government, however, may exercise through the company such control over exports as it may think necessary. The Government also has the right to purchase from and sell to the company certain quantities of silk when such operations may be helpful in adjusting prices to a given level.

In order to carry on the functions assigned to it, the control company was provided with a capital of 80 million yen, which sum may be increased with Government permission. Half of the capital is subscribed by the Government and the remainder by private individuals.

In addition to the establishment of the control company, the Government has organized also the Raw Silk Committee Conference, made up of Government officials and representatives of the industry. The main business of the Conference is to advise the Government on matters pertaining to the silk industry, and the decisions thus reached by the Government are carried out by the Japan Raw Silk Control Company. Numerous supplementary regulations have been added to facilitate the centralization of control over all phases of the silk industry in a single agency.

### CONCLUSION

Four months after the enactment of the above-described measures, the wholesale freezing of Japanese assets in the United States took place; trade relations between the two countries came to a standstill; and exports of silk from Japan to the United States ceased. This unprecedented development was pregnant with complications for an industry that for many decades had been geared to foreign markets. It is pertinent, therefore, to consider the possible effects of the cessation of Japanese silk exports

to the United States, first, upon the Japanese farmers engaged in cocoon raising, and, second, upon the Japanese war economy.

As far as the Japanese sericulturists are concerned, the adverse effect of the loss of the export market in the United States is likely to be greatly mitigated, for the time being, by a combination of factors. It may be well to recall that the Raw Silk Industry Control Law was the outgrowth of a downward trend of exports and of the consequent necessity of relying more and more on the domestic consumption of silk. This policy enunciated shortly before the trade relations between Japan and the United States were interrupted is being pursued now with greater vigor. To be sure, increased involuntary consumption of silk means lowering the Japanese standard of living, since consumers could buy much greater quantities of cheaper cotton goods. But the policy does spell relief for the farmers.

Cotton yarn and wool were scarce and rayon and staple fiber none too plentiful even when the shortage of foreign exchange was not as acutely felt as it is now. Under present circumstances, foreign exchange is well-nigh unobtainable, and its continued absence creates an additional consumer demand for silk as a substitute for these textiles. The domestic consumption of silk, which amounted to 47 million pounds in 1940, is expected in Japanese circles to increase to about 66 million pounds in 1941. It may be questioned whether this 40-percent increase can be achieved in the face of the high prices of silk textiles. If domestic consumption should fall short of output, the Japan Raw Silk Control Company probably would continue to absorb the surplus as it did in the past. But assuming that the program of adjusting Japanese silk output to domestic consumption, even on the high basis of 66 million pounds, can be carried out, this presupposes a reduction of silk output amounting to approximately 27 million pounds - or 29 percent of the annual average production during 1936-40.

To effect such a reduction the Government decreed the reduction of the mulberry area by 250,000 acres, or 19 percent below the annual average in the past 5 years. This land is not to be abandoned, but is to be planted to wheat, barley, and other foods. The cost to the Government of converting the land to such purposes is estimated at 24,550,000 yen (\$5,650,000). In the face of Japan's precarious self-sufficiency in food in the past couple of years, the loss sustained by the farmers in consequence of the disappearance of the export market might be compensated in some degree by an increased volume of food production. In addition, the high food prices in Japan would insure the farmers a relatively high income from the abandoned mulberry acreage. To be sure, the income might not be as large as that derived from cocoon raising, but it is clear that the decrease in the volume of cocoon raising will not spell a total loss as far as the sericulturists are concerned.

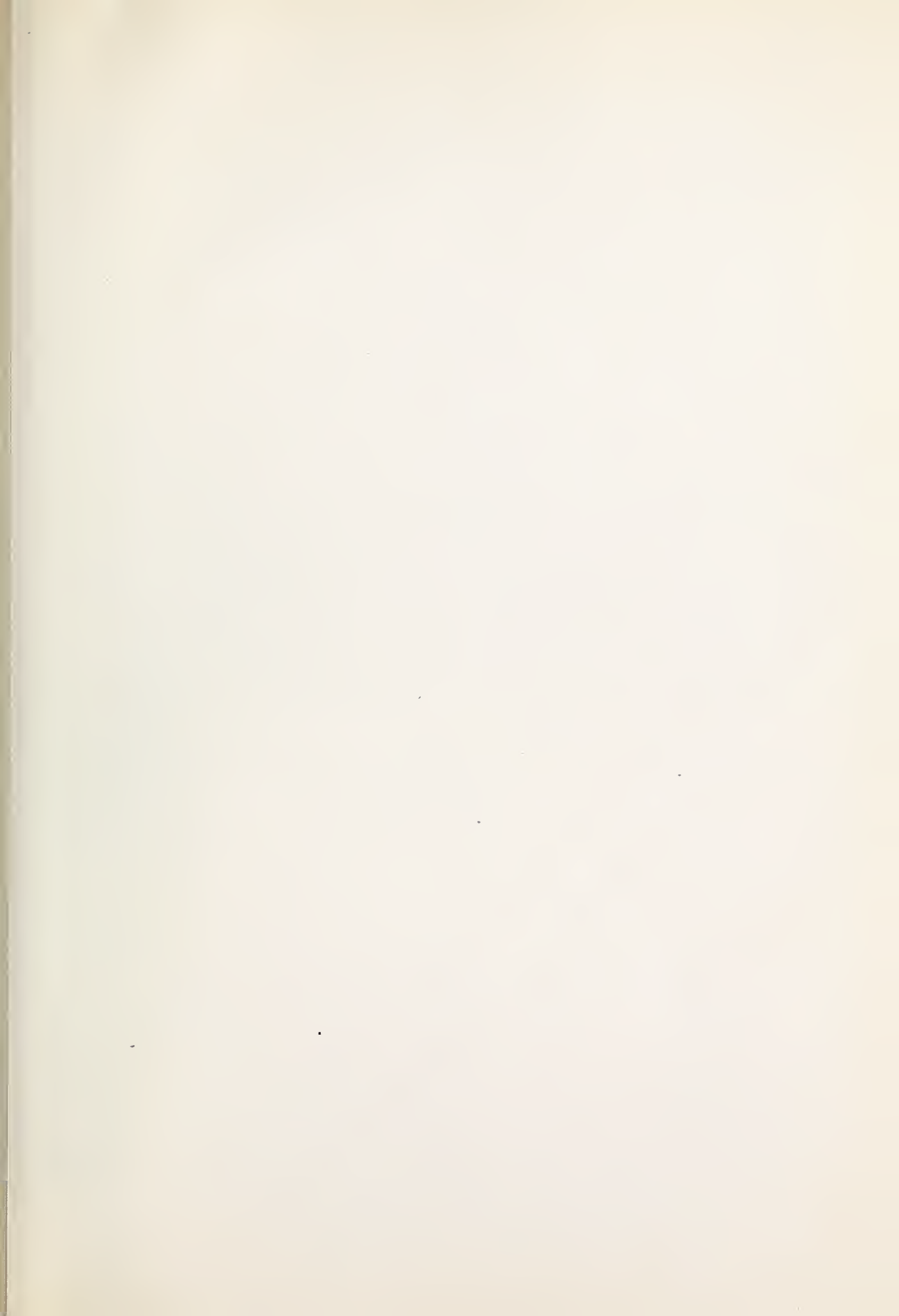
Moreover, the silk produced for domestic consumption is to be purchased by the Silk Control Company at a fixed price of 1,400 yen per bale. Even if the price should be reduced to 1,200 yen, a margin of profit is insured for the farmer who raises the cocoons and for the reeler who reels the cocoons into silk.<sup>13</sup> Thus the Government policy of guaranteeing the producers a fixed price for their output, a policy adopted when few in Japan expected the loss of the principal silk outlet, plus the raising of food crops on mulberry land and purchases of surplus silk, is likely to help the farmers overcome the crisis.

<sup>13</sup> ANONYMOUS. THE COMMODITY MARKET. *Oriental Econ.* 8: 475-477. 1941.



In the long run, however, when the crisis is over and food crops are not at a premium and cotton and wool are once again obtainable, the position of the Japanese sericulturists will not be an enviable one. Domestic consumption of silk can hardly be maintained at the expected high level; and the same may be said for the existing price structure. Furthermore, the crisis may bring about a general consumer acceptance of nylon in the United States hosiery industry, the last stronghold of Japanese silk. The longer the present embargo upon silk imports into this country lasts, the less certain it is that raw silk will again become one of the major fibers used in the United States. If it does not, not only may it be impossible for the Japanese industry to regain the market lost during 1930-40, but the foreign demand may shrink even below the pre-embargo level. In that event large numbers of Japanese farmers are bound to lose a valuable source of cash income and Japan to be again confronted with economic distress and political unrest.

That the stoppage of raw-silk exports to the United States is highly detrimental to the Japanese war economy admits of no doubt. Since trade between Japan on the one hand and the United States, the British Empire, and the Netherland Empire on the other hand has practically come to an end, Japan is in no position to import a number of raw materials that make the wheels of Japanese economy, and especially its present war industries, go round. Their accumulated reserves of stocks may have eased the situation somewhat for the time being, although some industries, such as cotton-textile manufacturing, already suffer from curtailed cotton imports. The role of silk as a means of paying for such imports has been a vital one, for approximately 40 percent of the net amount of foreign exchange received by Japan from its export merchandise trade has come from silk shipments. The lack of this exchange not only is contributing very heavily to the curtailment of consumers' goods but, by depriving armament industries of essential raw materials, is striking at a vulnerable spot of the Japanese war economy.



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